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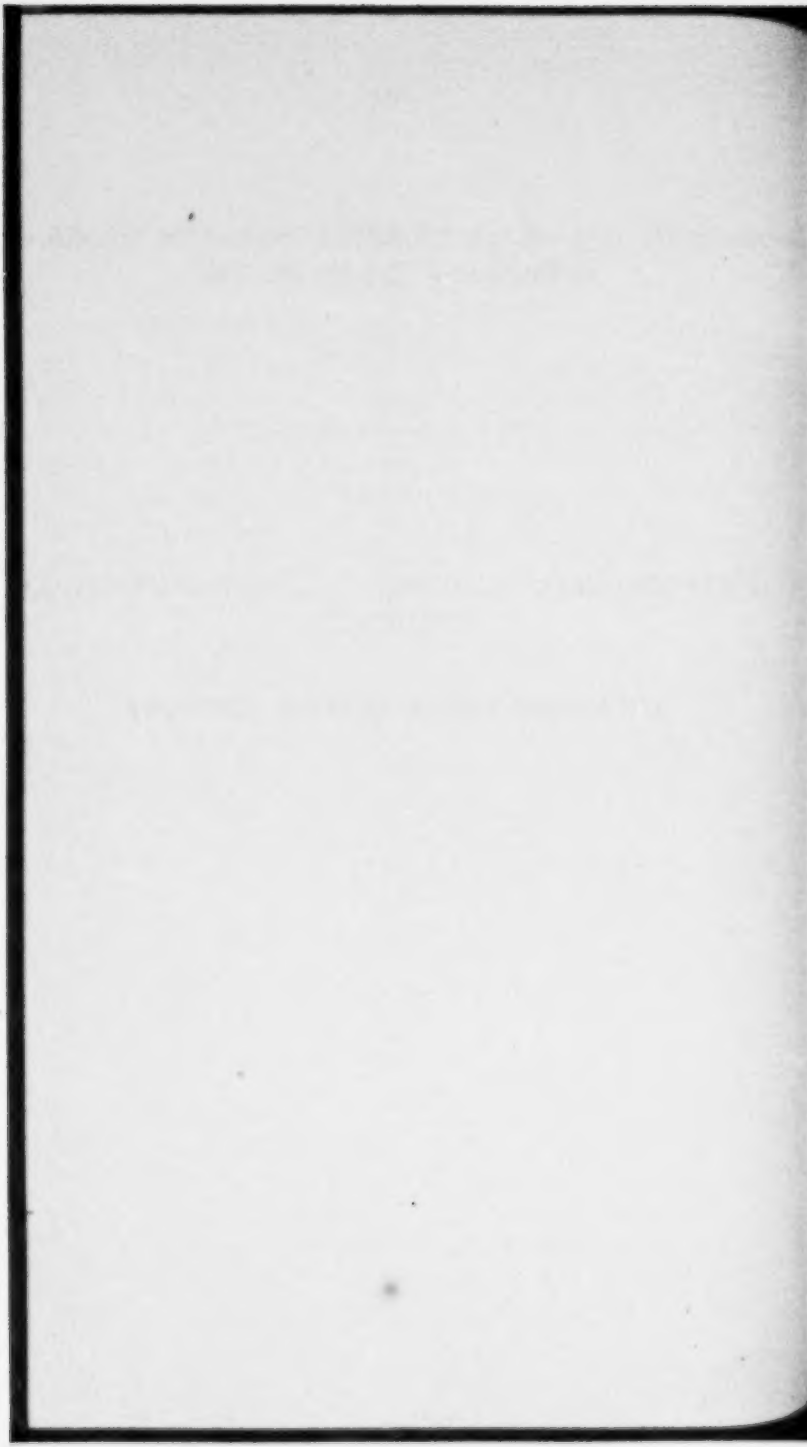
RESPONDENTS' PROFFER OF CONSTITUTIONAL EVIDENCE

ENGINEERS PUBLIC SERVICE COMPANY



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Q. Will you please state your name, address, and occupation? A. My name is Merwin H. Waterman; my address is School of Business Administration, University of Michigan, Ann Arbor, Michigan. I am Professor of Finance at, and Secretary of, the School of Business Administration.

STATEMENT OF COUNSEL: At this point I would like to say that I propose to qualify Dr. Waterman as an expert economist for the purpose of introducing through him certain economic data and opinions which relate to certain constitutional issues raised by the respondents in their answer and otherwise in this proceeding.

Q. Please state briefly your education, experience and qualifications for the position which you hold. A. I graduated from the University of Michigan in 1925 with a Bachelor of Arts degree and took my degree, also at the University of Michigan, as a Master of Business Administration in 1926. In 1932 I received a Ph.D. in economics at the University of Michigan. My business experience has consisted of working for Consumers Power Company at Jackson, Michigan where, during the years 1920 and 1921 I served as clerk in the general accounting department of that company; from time to time during the years 1922 to 1926, inclusive, I served as a clerk in the accounting and purchasing departments; and during the summer of 1924 I served as groundman on a line gang. For four months during the year 1937 I served as research consultant for Sheridan, Farwell & Morrison, Inc., investment counsellors in Chicago, Illinois. Beginning in 1936 and continuing to the present time I have been a member of the Board of Directors of Renown Stove Company, of Owosso, Michigan.

For one month during the year 1934 I was employed by the United States Government as a special investigator on the staff of the Treasury Department and was in charge of

a group of investigators in the Detroit area, working on a Treasury Department survey of bank lending policies.

My University experience, all of which has been at the University of Michigan, may be divided into three categories: teaching, research and administration. In the field of teaching, during the years 1926 and 1927 I was an Instructor in economics and business administration; during the years 1927 to 1929, inclusive, I was an Instructor in finance in the School of Business Administration; during the years 1929 to 1936, inclusive, I was an Assistant Professor of finance in the School of Business Administration; from 1936 to July 1941 I was Associate Professor of Finance and since that time I have been Professor of Finance. My research activities are exemplified by my employment as Research Assistant in the Bureau of Business Research during the summers of 1927 and 1928; as Research Associate in the Bureau of Business Research during the summers of 1929 and 1930; and as Assistant Director in the Bureau of Business Research throughout the years 1930 to 1937, inclusive, and during the summer of 1940. My occupation as Assistant Director, which I have just mentioned, was also in the nature of an administrative occupation and my other experience in the administrative field has consisted of acting as Secretary of the School of Business Administration from 1937 to date. I might add that the Bureau of Business Research is a division of the School of Business Administration, which School, in turn, is a graduate unit of the University of Michigan.

Q. During the course of your work, have you had occasion to have published any articles or studies? A. Yes. During the years 1934 to 1939, inclusive, I have had published in the Public Utilities Fortnightly a number of articles dealing with various phases of public utility financing, operation and management. I have also had published two Michigan business studies, one dealing with the financial policies of public utility holding companies, which was published in 1932 and the other dealing with public utility financing during the years 1930 to 1935, inclusive, which was published in 1936.

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STATEMENT OF COUNSEL: Does Commission Counsel wish to cross examine Dr. Waterman with respect to his qualifications?

Q. By the way, Dr. Waterman, it appears that you are reading from a prepared document. What is that document? A. It is a series of questions and answers which have been designed to present as clearly and as briefly as possible substantially all my direct testimony, including numerous exhibits.

Q. Please describe the manner in which that document was prepared. A. From an editorial point of view, the document represents a combination of efforts of myself and counsel for the respondents. In general, the questions were prepared by counsel for the respondents although the form and substance thereof were usually indicated by preliminary memoranda which had been prepared by me. In general, the answers were either prepared by me or lifted more or less bodily from material prepared by me and furnished to counsel for respondents.

Q. Will you expand that statement so as to show just exactly how these questions and answers were prepared? A. Yes. The initial results of my studies, which I shall later describe, were prepared in the form of a series of exhibits and preliminary memoranda commenting on the exhibits. These exhibits and preliminary memoranda were submitted by me to, and discussed with, officers of the respondents and their counsel. During such discussion, counsel for respondents suggested that in view of the length and, in some respects, the complexity, of the studies and the large number of exhibits involved, the data in question could be presented to the Commission in a more expeditious and orderly manner if set forth in the form of a series of questions and answers. I agreed with that suggestion. Thereupon, counsel for respondents and I worked jointly in transforming the preliminary or working-paper memoranda into question and answer form. Counsel for respondents concentrated on the form of the questions although, as I have stated, the form of the questions was usually indicated by

my preliminary memoranda. I concentrated on the answers. All the answers were thus either written by me or taken from preliminary memoranda or working papers prepared by me.

Q. Are these answers yours? A. They are. The content and substance of each answer were arrived at by me in an entirely independent manner and I accept full responsibility for each answer. In some cases I made or accepted changes in the form of the answer at the suggestion of counsel for the respondents but the substantive part of each and every answer is entirely mine.

Q. You have referred to a series of exhibits which were prepared by you. What are those exhibits? A. Those are the exhibits which I propose to describe and explain in the course of my direct testimony. I understand that they are to be offered in evidence.

Q. What is the relation or importance of said exhibits to your testimony? A. I would say that the exhibits are the most important part of all of my testimony in respect to all the lines of my research and studies, with one exception. In general, the results of my studies are set forth on the exhibits and most of my testimony will be explanatory or interpretive of the exhibits.

Q. Did any officer of the respondents or any counsel for the respondents or any one in any way related to or connected with the respondents have any part in the preparation of any of these exhibits? A. No.

Q. Did counsel for the respondents or any one else in any way related to or connected with the respondents make any suggestions as to the preparation or revision of the exhibits? A. Generally, no. I might add that when all but a few of the exhibits and preliminary memoranda had been completed I went to New York and discussed the whole study with an officer of the respondents and with counsel for the respondents. At that time, largely at my suggestions, it was jointly decided to simplify certain of the exhibits by omitting certain sub-classifications used on some of the exhibits, which sub-classifications, I had con-

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cluded, upon the completion of my entire study, had no significance to the objects of the study.

Q. Does your testimony with respect to the manner in which these questions and answers were prepared apply to the entire document from which you are reading? A. Yes, with the exception of the last few questions and answers dealing with the manner in which the other questions and answers were prepared. The last few questions and answers dealing with the matter of preparation of the document from which I am reading were wholly the idea of and were suggested by counsel for the respondent. They submitted to me a draft of said questions and answers which I approved without practically any change because they accurately stated the facts.

Q. Have you been employed by the respondents in this proceeding to make certain studies relating, generally, to the economics of public utility companies and public utility holding companies? A. Yes.

Q. Will you state how you came to undertake said studies? A. Before doing that, may I briefly define certain terms which I shall use. I shall have occasion frequently to mention the Public Utility Holding Company Act of 1935. Said Act I shall usually refer to merely as the "Act". When I refer to Section 11 of the Act, I shall always mean to refer, unless I specify otherwise, to Section 11 (b) (1) of the Act. By the term "holding companies," which I shall frequently use, I shall refer, unless I specify otherwise or unless the context indicates otherwise, to those holding companies over which the Securities and Exchange Commission has jurisdiction under the Act, that is registered holding companies. When I use the term "utilities" or the term "operating utilities" or the term "operating companies" I shall refer only to electric and gas utilities as defined in the Act unless I indicate otherwise. Sometimes when I use the word "utilities" or any of the synonymous terms mentioned it will be clear from the context that I refer only to electric utilities or to electric utilities and combination gas-electric utilities. By the phrase "independent utilities" or "independents" I mean, with two minor exceptions to be explained later, utilities which are not subject to the Act even though technically such utilities may have certain corporate interrelations with other corporations and be subject to certain control by another corporation. By the phrase "holding company subsidiaries" I mean utilities which are subsidiaries of holding companies which are registered under the Act. At times I shall refer to such holding company subsidiaries merely as "subsidiaries" or as "subsidiary companies" or as "operating subsidiaries." Upon occasion I shall, both in my testimony and in exhibits, refer to "mutual service companies." I do not use that phrase precisely with the meaning which it has in the Act. As I use said phrase, it includes all affiliated or intra-system service companies and all companies, whether or not strictly

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service companies, which render management services to one or more operating utilities in the same holding company system. I shall sometimes refer to the Securities and Exchange Commission by the alphabetic designation "S.E.C." and the Federal Power Commission, similarly, as "F.P.C." It will be necessary for me subsequently to define certain other terms.

Q. Will you now state how you happened to undertake the studies you have referred to? A. In August, 1940, I was called to New York by representatives of the respondents for an interview. At that time an officer of the respondent Engineers Public Service Company told me that counsel for respondents had made a study of the Act and its legislative history for the purpose of ascertaining its policies and objectives as well as the regulatory devices created in Section 11 of the Act, and that it was their feeling that no real or reasonable relationship existed between the regulatory or remedial devices of Section 11 and the objectives of the Act. He also stated that the respondents had made some preliminary studies which led them to believe that said lack of relationship could be conclusively demonstrated by an adequate statistical study. I was requested to make such a study.

Q. Did counsel for the respondents outline to you their conception of the objectives of the Act? A. Yes.

Q. What were the objectives of the Act as so outlined to you? A. Counsel for respondents stated that in their opinion the ultimate or fundamental objectives of the Act were the protection of consumers of electricity and gas and the protection of investors in utilities; and they expressed the view that all of the abuses which the Act sought to correct and all the purposes sought to be accomplished thereby, were directly related in varying degrees to six factors, affecting either the public served or the investor in utility securities or both. Said six factors were as follows: (1) the cost of electricity and gas to consumers; (2) economy of management and operation of operating companies; (3) economy in raising capital for and financial management of utilities; (4) protection of investors in utili-

ties; (5) effectiveness of regulation of utilities; and (6) adequacy and efficiency of service by utilities.

Q. Did counsel for respondents indicate to you that they regarded said six factors as mutually exclusive and of equal importance? A. On the contrary, they expressed the opinion that some of said six factors overlap each other and that some are of relative unimportance, being means to desired statutory ends rather than ends in and of themselves. Thus, it was stated to me that there is nothing in the Act to indicate that "effectiveness of regulation" was sought as an end in and of itself, but rather as a means of achieving the fundamental objectives of the Act, namely, protection of consumers of gas and electricity and protection of investors in the securities of utility companies. Similarly, it was pointed out that economy of management and operation, economy in financial management, and adequacy and efficiency of service, were sought to be achieved by the Act not so much as objectives to be desired in and of themselves but rather to the ultimate end of protecting consumers and investors. They stated that in their opinion the most important of the six factors was the cost of utility service to consumers, since factors such as economy of management and operation, economy in financial management, effectiveness of regulation, and adequacy and efficiency of service, all tend to be reflected in the cost at which electric and gas services are rendered to the consuming public.

Q. What were the regulatory or remedial devices of Section 11 as outlined to you by counsel for the respondents? A. The analysis of Section 11 in this respect submitted to me by counsel for respondents was substantially as follows: The primary regulatory impact of Section 11 of the Act, when read with the definition of an integrated public-utility system as set forth in Section 2(a)(29) of the Act, is in respect of the character of control exercised over utility companies; that is to say, Section 11 seeks primarily to regulate the character of control over utilities by limiting the kind and character of holding companies that may continue to exist. Section 11 seeks to accomplish such limitation by restricting the size and relative geographic location

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of the utilities which any one holding company may continue to control. Accordingly, in addition to affecting the character of control over utilities, Section 11 exerts a regulatory impact both in respect of the size of an operating utility, whether regarded separately or as part of a holding company system, and the relative geographic location thereof. The impact of Section 11 upon size and the relative geographic location of operating utilities is, of course, subsidiary to its impact on the character of control thereof for the reason that Section 11 has no operative effect at all, regardless of the size or relative geographic location of utility properties, unless they are controlled by a holding company.

Accordingly, in the words of counsel for respondents, the regulatory devices of Section 11 may be said to involve (1) the character of control over utilities, (2) the size of operating utilities, both as separate integrated systems and as parts of holding company systems, and (3) the relative geographic location of the operating utilities in any holding company system.

Q. Having thus explained to you their conception of the regulatory devices of Section 11 and the statutory objectives, what did counsel for respondents request you to do? A. Stated in a rather general manner, I was asked to make an impartial and objective study to determine whether there is any relationship and, if so, what relationship, between the regulatory devices of Section 11 which I have mentioned and the statutory objectives which I have also mentioned. Stated in more detail, I was asked to make a study to determine whether there are any discernible economic disadvantages which are peculiar to (1) utilities which are controlled by holding companies, (2) utilities and utility holding company systems of large size, and (3) utilities which are related to each other geographically in a manner not permitted by Section 11.

Thus, for example, my attention was called to the fact that Section 1 of the Act contains the suggestion, among others, that consumers have been forced to pay more for gas and electric services than otherwise would have been

the case because some utility companies have been controlled by holding companies; that some electric and gas rates have been maintained at unnecessarily high levels by reason of excessive service charges and excessive dividends required from subsidiary utility companies by holding companies; that some utilities and holding company systems have become so large that they are unwieldy and inefficient with resulting higher rates and less adequate service to consumers and lower returns to investors. I was asked to undertake a study to determine whether these charges are generally true as applied to all holding companies, and whether the suggested economic disadvantages or evils are more generally associated with holding company subsidiaries than with independent utilities. To state it more accurately, I was asked to undertake a study to determine whether there is any evidence that the suggested economic disadvantages or evils are really a function of the fact, or have any real relation to the fact, that a utility is controlled by a holding company, or that a utility or a holding company system reaches a large size, or that utility units in a holding company system are not situated geographically with respect to each other in the manner required by Section 11.

Q. Did counsel for the respondents discuss with you methods and means by which it could be determined whether the regulatory devices of Section 11 have any relationship to the objectives of the Act? A. Only in a very general way. I was told that the selection of methods and means of accomplishing the desired comparisons would be left entirely to me.

Q. What happened after your initial conference with respondents and their counsel? A. After discussing the matters I have mentioned at some length, I agreed to make a preliminary investigation as to the practicability of making studies of the character proposed. I made such an investigation and concluded as a result thereof that a large number of the relationships in question could be studied and measured statistically.

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Thereupon I agreed to undertake a complete statistical research in regard to such relationships. It was understood that my sole responsibility in the matter was to develop facts and that, as the work progressed, if the results did not appear to have any value to the respondents, the work could be stopped at any time. I also reserved the right to withdraw from the work if at any time I became unwilling or unable to continue the investigation.

I may say that the work proved to be a greater task than I anticipated when I agreed to undertake it. I used all the time I could spare from my regular duties between August 1940 and May 1941 in supervising the work, and I kept two competent statisticians busy full time and in addition used part time assistance from several other workers. The major part of the statistical studies were completed toward the end of February 1941.

Q. Did the respondents indicate to you at the outset of their conversation with you, or at any subsequent time, that they expected you to reach any specified or stated result or results? A. No. They indicated their belief as to what the facts—then unknown—would prove to be.

Q. Did they at any time request you to prepare studies to support any particular conclusion which they suggested or indicated to you? A. The answer is again no. I was told that my survey was to be wholly impartial and objective; that I was being retained to ascertain the facts and that I should "let the chips fall where they may."

Q. Did you have any understanding with respondents regarding publication of the results of your study and research? A. Yes, it was agreed at the outset, and was one of the conditions of my undertaking the study, that I should have the right to publish the results thereof in any form I might desire.

Q. Did this understanding with respect to publication of the results of your study influence your willingness to undertake the same? A. Yes, the study bore directly on previous research that I had undertaken and I welcomed the opportunity to do further work in that field.

Q. Have you taken any steps towards publication of the results of your research? A. Yes, on April 8, 1941, I submitted a rough draft of manuscript to the Assistant Director of the Bureau of Business Research at the University of Michigan with the request that he appoint an editorial committee to pass on the desirability of publishing the results in the form of one of our Michigan Business Studies. On April 23, 1941 the Assistant Director informed me that the study had been approved for publication and that I should proceed to make it ready for press.

Q. Will you please state the amount of money which you have received or expect to receive from the respondents as payment for your work in preparing the studies which you have described? A. I have received for all my work up to July 14, 1941, in connection with said studies the sum of $3,310. In addition, I have received, as reimbursement for my actual out-of-pocket expenses, such as traveling expenses and stenographic expense, the sum of $1,446.99. I have received, for wages and salaries paid to my assistants in connection with said studies and for the actual out-of-pocket expenses of my assistants, the sum of $2,904.19. In addition, I have received the sum of $1,420.02 which was paid to the University of Michigan for services of its Sorting and Tabulating Station in connection with the studies. The aggregate of all these figures is $9,081.20. This figure covers all my services and disbursements in connection with these studies through July 14, 1941. It does not cover any fee or expense involved in my appearance here in Washington to appear as a witness in this proceeding.

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Q. Now, Dr. Waterman, will you outline the specific studies which you have made? A. My studies fall into four major divisions or groups. Each of the first three of these groups is devoted to a determination of the relationship, if any, between one of the several factors which I have referred to as the regulatory devices of Section 11 and the several other factors which I refer to as the objectives of the Act.

Thus, the first major group of studies deals with the relationship between the factor of holding company control and (1) the cost of electric service to consumers, (2) the economy of management and operation of utilities, (3) the soundness of financial management of utilities and (4) protection of investors in utilities.

The second major group of studies deals with the relationship between the factor of size of operating company and the same four objectives. The third major group of studies deals with the relationship of the factor of size of holding company system to the same four objectives.

Then, there is a fourth group of studies which deal with the relationship between the distance of the operating company from the main office or general headquarters of its holding company to the same four statutory objectives. As I will point out later, this fourth group of studies occupies a somewhat different position than the first three groups.

Finally, there is a fifth study which deals primarily with the relationship between the factors of holding company control and the effectiveness of public regulation of operating utilities.

I should point out that my studies do not deal in any way with municipally-owned utilities; they are concerned solely with so-called privately owned utilities.

I wish also to point out that my studies deal only with electric utilities and with combined gas-electric utilities and not with gas utilities as such. The Federal Power Commission does not publish, and there are not otherwise available, gas rate and bill data similar to the Federal Power Commission electric rate and bill data which I have used in these studies. Accordingly, it has not been possible to

make nation-wide comparisons of gas rates and bills of the character of the electric rate and bill comparisons required for my purposes. Moreover, so far as factors other than rates and bills are concerned, relatively there are so few exclusively gas utilities for which data are available as to preclude statistical comparisons of the kind I have undertaken with respect to electric and combined gas-electric utilities. Furthermore, the exclusively gas utilities are divided as between natural gas companies, manufactured gas companies, and companies which distribute a mixed product of natural and manufactured gas. Plainly, in view of the wide differences in characteristics and operating conditions, statistical comparisons with respect to exclusively gas companies of the sort which I have made with respect to electric utilities and with respect to combined gas and electric utilities would be of little value.

Q. Before taking up the several groups of studies, will you discuss generally the statistical approach which you have made to them, and outline in a general way the problems with which you were confronted in securing and preparing the data on which the studies are predicated. A. I was at the outset confronted with several problems of classification. Determination of the relationship between the factor of holding company control and the objectives of the Act required numerous comparisons as between holding company subsidiaries and independent utilities. It was necessary, therefore, to determine a basis for classifying operating utilities into groups which would satisfactorily distinguish independent utilities from holding company subsidiaries.

Similarly, determination of the relationship between the factor of size of operating company and the objectives of the Act required comparisons between groups of operating utilities of various sizes. This called for the selection of a measure for classifying operating utilities according to size.

Likewise, determination of the relationship between the factor of size of holding company system and the objectives of the Act required comparisons between operating utili-

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ties belonging to holding company systems of different sizes. It was thus necessary to select a measure for classifying holding company systems according to size of the system.

In the same manner, determination of the relationship between distance of operating subsidiaries from the general headquarters of their respective holding companies and the objectives of the Act required the selection of a method of classifying operating subsidiaries according to their distance from their respective general headquarters.

In addition to these problems of classification of operating utilities, I was at the outset confronted with the task of selecting various criteria or indexes by which to measure the respective performances of the operating utilities within the various classifications which I have mentioned. While it will be necessary later to go into the reasons for selecting these particular criteria or indexes in some detail, it will I think be helpful at this point to enumerate some such criteria or indexes.

Thus, in order to measure the impact of utility operation on the consuming public or, to state it differently, to measure the cost of electric service to consumers, I used weighted average typical bills for residential electric service. In order to measure efficiency and economy of management and operation of utilities, I used a series of four indexes, namely, average residential electric bills, average executive expenses, average administrative and general expenses, and average management fees. In order to measure the soundness and economy of financial management of operating utilities, I employed several financial ratios, such as the percentages of earnings used for bond interest, for preferred stock dividends and for common stock dividends. In order to measure or analyze the protection accorded to investors in utilities, I used several ratios such as the number of times bond interest was earned, the number of times both interest and preferred stock dividends were earned overall, and the balances of gross revenues remaining after all fixed charges.

In respect of all these matters, that is, in respect of the several classifications of operating utilities and in respect of the various tests or measures of the performances of operating utilities, it was necessary at the outset to determine the most dependable and most generally available sources of information and then to collect such information.

The foregoing, of course, is only a general outline of the statistical approach which I have made to the studies.

STATEMENT OF COUNSEL: I would like to state for the record that at this point I propose to ask Dr. Waterman certain questions designed to bring out some of the details of the statistical approach and methods employed in these studies. I think this will be helpful as an aid to understanding and presenting the studies. Some of the details as to the statistical approach and procedure are applicable only to individual studies. It will be desirable, if not indeed necessary, to defer discussion of such details until we come to the individual studies in question.

Q. Will you now describe the manner in which you classified operating utilities with respect to the character of their ownership or control; that is, will you describe the manner in which you undertook to classify operating utilities as independent utilities and as holding company subsidiaries? A. I think I can best answer that question in light of a table which I have prepared entitled "Characteristics of Sample Used in Study of the Economies of Public Utility Holding Companies as Applied to Electric Utilities as of 1939."

(Have Exhibit III-1 marked Exhibit ..... for Identification).

Q. Was Exhibit ..... for Identification (III-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (III-1). A. It is a table which classifies 636 operating utilities into

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nine classes according to the character of the ownership and supervision of utilities. The table shows in respect of the operating utilities comprising each classification, as of 1939, the number of companies in each class, the combined sales of electricity to ultimate consumers, both in dollar amounts and as a percentage of total sales, the population served, both in numbers of population and as a percentage of the total population served, the numbers of communities served, and the average population served both per company in the group and per community served by the group. The table also shows, at the bottom thereof, among other data, the dollar amount and percentage of the total sales of electricity to ultimate consumers by private utilities represented by the 636 operating utilities classified in the table.

I want to make clear at the outset that the actual number of operating utilities classified in the table is not really 636 but 546. This discrepancy results from the fact that for purposes of my studies each operating utility has been counted once for each State in which it provides electric service. There are 67 companies operating in more than one State which account for the 90 duplicates in the total of 636 to which I refer. The principal reason for this manner of treatment arises from the fact that the Federal Power Commission compiles its electric bill and rate data on this basis. Moreover, if this basis were not employed, it would have been impossible for me to classify operating utilities according to various geographical divisions as I have done in some of my studies; and it would have been very difficult for me to have classified them according to size of community served as I have done in some of my studies. While I shall, throughout my testimony, refer to 636 operating utilities as comprising my complete sample, it should be borne in mind that actually the complete sample consists of 546 separate, corporate operating utilities.

Q. Directing your attention to the column under the word "Code" and the column under the heading "Control Class Description" on Exhibit ..... for Identification (III-1), will you please describe the manner by which you undertook to classify operating utilities according to the

nine classifications listed on the Exhibit? A. The problem of classifying the 636 operating utilities into groups according to type of ownership or control thereof involved essentially the division of all utilities throughout the nation, so far as possible, into two main groups, namely, independent utilities and holding company subsidiaries. However, I approached this problem with the idea of setting up various subdivisions of these two main groups which might be significantly different in their economic and corporate aspects. On the basis of my preliminary study and observation, the following classifications suggested themselves to me: First, there would be the independent utilities in the strictest sense, that is, operating companies which do not give evidence of any holding company control or of any corporate parent, either by virtue of stock ownership or otherwise. Into this class would fall each operating utility having no person or corporation owning more than 10% of its voting stock and every operating utility which had been declared by the S.E.C. not to be a subsidiary company under the Act. I found that there were 122 companies of these two types, and they were placed in one class called class number "0" on Exhibit ..... for Identification (III-1). Careful investigation satisfied me that these 122 companies were not only in form, but actually, free of any holding company control. With but two exceptions all operating utilities placed in this class number "0" are, by express order of the S.E.C. or by clear implication, exempt from the provisions of the Act. Said two exceptions, namely, Citizens Utilities Company and Sioux City Gas and Electric Company, are registered holding companies because they control operating subsidiaries but, as operating companies, they are themselves free from outside holding company control, and, to the extent that they are operating utilities, they are necessarily included in my classifications as "independent utilities." The subsidiaries of Citizens Utilities Company and Sioux City Gas and Electric Company are, of course, included in my classification as "holding company subsidiaries."

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Secondly, there would be another group of operating utilities, unlike the class number "O" companies in form but like them in substance and which obviously should be classed as independent utilities. The group would consist of those operating utilities which are in form holding company subsidiaries because a substantial portion of their stock is held by another corporation, but which are exempt from the Act because in effect they constitute merely separate operating divisions of their respective parent corporations which are themselves exempt from the Act either because they are essentially operating utilities or because they are intrastate in character. I found that there were 58 companies of this type and they were placed in one class called class number "1" on Exhibit ..... for Identification (III-1).

It seemed clear at this stage that all the remaining electric utilities in the country could properly be labeled "holding company subsidiaries." It occurred to me, however, that it might be helpful for the purpose of my studies further to sub-classify such holding company subsidiaries. For example, certain holding company subsidiaries employ mutual service companies to aid them in management and some do not. Before I embarked upon my studies, it seemed to me that there might be such characteristic differences between these two types of holding company subsidiaries as to justify separate classification. Furthermore, those holding company subsidiaries which employ service companies to aid them in management use various methods of accounting for management fees and expenses, and for this reason it seemed desirable at the outset to effect a further sub-classification of such subsidiaries in case, as my studies progressed, it became necessary to recognize any difference in the accounting treatment of such fees and expenses. Accordingly, I subdivided the holding company subsidiaries which use service companies to aid them in management into three sub-classifications which appear as classes numbered "2", "3" and "4", respectively, on Exhibit ..... for Identification (III-1).

Class number "2" consists of those holding company subsidiaries, 69 in number, all of whose management fees and expenses are allocated to various expense accounts and thus may be said to be lost in the books of account.

Class number "3" consists of those holding company subsidiaries, 148 in number, a part of whose management fees and expenses are allocated to various expense accounts and part of whose management fees and expenses are charged to Account No. 794 of the F.P.C. Classification of Accounts (Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, effective January 1, 1937).

Class number "4" consists of those holding company subsidiaries, 107 in number, all of whose management fees and expenses are charged to said Account No. 794.

Further, at the outset of my studies, it seemed desirable to sub-classify holding company subsidiaries which do not employ mutual service companies to aid them in management on the basis of differences in percentages of voting control. Accordingly, the last mentioned group of holding company subsidiaries were sub-classified into classes numbered "5", "6" and "7" on Exhibit ..... for Identification (III-1). Class number "5" consists of operating utilities controlled by holding companies having a voting power in excess of 75%, class number "6" consists of companies controlled by holding comanies having a voting power of between 50% and 75%; and class number "7" consists of companies controlled by holding companies having a voting power of less than 50%.

After the classifying of operating utilities had proceeded to this point, there were left only two companies, namely, Jersey Central Light and Power Company, two-thirds of the voting stock of which is owned by National Public Service Company and one-third of the stock of which is owned by Associated Gas and Electric Company, and Public Service Electric and Gas Company, two-sevenths of the stock of which is owned by United Gas Improvement Company and one-seventh of the stock of which is owned by United Corporation. These two companies appeared to be

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neither fish nor fowl so far as my classification was concerned and hence they were classified by themselves as class number "8" on Exhibit ..... for Identification (III-1). Investigation disclosed that these two companies are independently operated, there being no evidence of actual control in either case by any of the respective corporate owners of the voting stock, and neither has been classified by the S.E.C. as a holding company subsidiary.

Throughout the development and preparation of my studies I maintained the nine original classifications of operating utilities indicated on Exhibit ..... for Identification (III-1); that is, in my working papers I broke down all the data into the several sub-classifications whenever there were any comparisons to be made as between independent utilities and holding company subsidiaries. As the studies progressed, however, it became apparent that many of the sub-classifications were quite without meaning so far as the object of my studies was concerned. Thus, the sub-classification of holding company subsidiaries which have mutual service contracts according to differences in accounting for management fees and expenses proved to be of no significance. Similarly, sub-classification of holding company subsidiaries which do not have mutual service contracts according to the extent of voting control possessed by their respective holding companies served no useful purpose.

Accordingly, for the purpose of presenting the results of my studies to this Commission, I have grouped the operating utilities which comprise classes number "0", "1" and "8" on Exhibit ..... for Identification (III-1) as one group which I have called "independents" or "independent utilities". They are all alike in the sense that they are independent of any degree of control by a registered holding company. Similarly, the operating utilities in classes "2", to "7", inclusive, on Exhibit ..... for Identification (III-1) have been grouped as one class, called "holding company subsidiaries". All of these companies are alike in that they are operating subsidiaries of registered holding companies.

The merging of the several sub-classifications of electric utilities on Exhibit ..... for Identification (III-1), as just stated, produced as of January 1, 1940, as my complete sample, a group of 182 independent utilities and a group of 454 holding company subsidiaries, for which data were found to be available on the various points to be studied. Eliminating the duplicates resulting from the fact, which I have previously mentioned, that operating utilities have been counted once for each State in which they operate, there are actually 163 independent utilities and 383 holding company subsidiaries in my complete sample. For reasons already made clear, I shall continue to refer to said 163 independent utilities as 182 independent utilities and to said 383 holding company subsidiaries as 454 holding company subsidiaries.

I might add that I have preserved, and without too much trouble can secure, the figures showing the results for each of the various sub-classifications of utilities with which I started out on my studies. I might also add that the results for each such sub-classification approximate very closely the results for the larger groups which I am now employing for the purpose of presenting the results of these studies to the Commission.

Q. You stated that your complete sample consists of 182 independent utilities and 454 holding company subsidiaries. Do you regard the number of units in each of these two groups as adequate to measure the relative performance of the two groups with respect to the subject matters of your studies? A. There is no question but what the sample is adequate for purposes of the principal phases of the studies. These 636 companies, referred to in Exhibit ..... (III-1) account for nearly 96% of total sales of electricity to ultimate consumers by private utilities as reported by the Edison Electric Institute for the year 1939. The complete sample thus represents substantially the entire private electric utility industry of the nation. The 182 independent utilities served 33% of the total population covered by the study during 1939 and during the same year accounted for 35% of the private sales of electricity to ultimate con-

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sumers. The 454 holding company subsidiaries referred to on Exhibit ..... for Identification (III-1) served 67% of the total population covered by the study during 1939 and, in their turn, accounted for 65% of the total private sales of electricity to ultimate consumers. It is true that, as indicated in Exhibit ..... for Identification (III-1), 366 operating utilities reporting to the F.P.C. are not included in the sample because of lack of complete or comparable data except for electric bills. For the most part they are small, isolated operating companies which furnish insufficient data to the F.P.C. to permit classification for purposes of my studies. These 366 companies serve an average population per company of only 993 and a total population of only 363,000; and they operate on the average in only 1.5 communities apiece. Their omission from the complete sample does not prevent it from fairly representing the entire private electric utility business of the nation.

Q. By the way, did you use exactly the same groups of operating utilities in each of your studies? A. No. There are considerable variations in the numbers of utilities comprising the samples in the different sections of the studies. In the case of each study, however, I used as the sample all the companies, both independent utilities and holding company subsidiaries, for which the data in question were available.

Q. Where did you secure the data which you used in classifying utilities according to the character of their ownership or control, that is, in classifying utilities as independent utilities or as holding company subsidiaries, and the other data reflected on Exhibit ..... for Identification (III-1)? A. I used the published lists issued from time to time by the S.E.C. showing the Commission's classification of utility operating companies at various dates, particularly a list dated August 31, 1940, entitled "Registered Public Utility Holding Companies." This latter list completely covers classes numbered "2" to "7", inclusive, on Exhibit ..... for Identification (III-1) since it lists all subsidiaries of registered holding companies. By process of elimination said list also characterizes all operating utili-

ties not listed therein as independent utilities. I checked the results with Moody's 1940 Manual of Public Utilities.

The information required for the purpose of sub-classifying holding company subsidiaries in classes numbered "2", "3" and "4" on Exhibit ..... for Identification (III-1) was obtained from analyses of annual reports of companies made to the F.P.C. for the year 1939 on F.P.C. Annual Report Forms No. 1, Schedules 427 and 550, and Expense Account No. 794 for each company. Schedule 337 in F.P.C. Form Nos. 96 and 97 furnished this information for the smaller utilities.

The data as to the sales of electricity to ultimate consumers were taken from the reports of the Federal Power Commission. The figures as to populations served were taken from the 1930 United States census as shown on the F.P.C. rate cards. (Here offer Exhibit ..... for Identification (III-1) in evidence.)

Q. Having described your classification of operating utilities according to character of ownership or control, will you now state how you classified operating utilities with respect to size of operating company? A. Two different types of classifications according to size of operating company were employed. For purposes of those studies dealing with electric rates and various costs of management and operation, I classified operating utilities by size of operating company groups on the basis of "Total Sales of Electric Energy." I did this because I believe that the factor of total sales of electric energy is a truthful indicator of the physical factor of size of company. Hereafter, throughout my testimony, I shall refer to "Total Sales of Electric Energy" by the shorter phrase "Total Electric Revenues."

For those phases of the studies dealing with operating utilities as corporations, namely those studies of soundness of financial policies and protection of investors, I classified them into various size of company classifications on the basis of "total gross revenues." This, in my opinion, is the most accurate measure of size of company for the purpose of making comparisons of a financial or corporate character because all sources of revenue contribute to cor-

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porate size and to its relation to financial operations. Nonrecurring revenues from outside the broad field of utility operation were, however, excluded from "total gross revenues" in order to avoid any influence not truly a part of utility operations.

Q. How did you classify holding company systems according to size? A. Holding company systems were classified according to size for purposes of my study on the basis of their consolidated gross revenues. Such size might, of course, have been measured by total system electric revenues. If each utility division in a holding company system were separately run, the use of total electric revenues would be a fair measure of the electric business, and thus of the extent of electrical skill and experience that could be assumed to exist in, or be available to, the system. More realistic in the business sense, however, is the index of consolidated gross revenues which more accurately reflects the size, power and influence of a holding company system. Whether revenues come from oil, gas, electricity or street railways, they contribute to the size of the business, to its dollar volume and to the scope of its influence. On the basis of these considerations, I determined to employ consolidated gross revenue, as the measure of holding company system size.

Q. From what sources did you secure the data which was necessary in order to classify operating utilities and holding company systems on bases of size in the manner you have described? A. I secured the data with respect to total electric revenues, that is, total sales of electric energy, from F.P.C. Annual Report Form No. 1 (page 508, line 14) for all companies using Form No. 1, and from F.P.C. Forms Nos. 96 and 97 (page 506) for companies having less than $250,000 annual gross revenues. Total gross revenue figures were obtained from Moody's 1940 Manual of Public Utilities and were checked with F.P.C. and S.E.C. reports. Figures as to consolidated gross revenues of holding company systems were obtained from Moody's 1940 Manual of Public Utilities. In the case of a few small systems, consolidated gross revenues were not available and it was neces-

sary to add together revenues of the operating constituents to arrive at a figure for classification purposes.

Q. You have stated that in measuring cost of electric service to consumers and in part for measuring economy of management and operation of utilities you used, respectively, weighted average bills for residential electric service and average bills for residential electric service. Will you state the sources of your information with respect to electric rates and bills? A. Data as to electric rates and bills were secured from the series of publications of the Federal Power Commission entitled, "Typical Electric Bills—1940." There is one such publication for each State. Actually, however, through the courtesy of the Hon. Leland Olds, Chairman of the Federal Power Commission, and his staff, there were made available to me duplicate copies of the F.P.C. "Typical Bill Cards," F.P.C. Form No. 69, and the F.P.C. "Company Cards," F.P.C. Form No. 56, containing complete electric bill data, identified as to company, for all communities in the United States having a population of over 250, as of January 1, 1940. These cards are punched Hollerith machine tabulating cards which represent the printed electric rate and bill data contained in the F.P.C. publications I have mentioned. There is one such typical bill card for each of about 18,000 communities in the United States having a population of 250 or over. It would have been possible for me to have produced similar Hollerith machine cards from the information in the said F.P.C. publications. However, apart from the fact that the expense would have been considerable, there would have existed a possibility of error in punching a new set of cards, which possibility was eliminated because of the courtesy of the Federal Power Commission in making their own Hollerith cards available for mechanical duplication by International Business Machines Corporation at its Washington, D. C., office.

Q. Will you describe generally the statistical techniques which you used in handling the data which you assembled. A. The statistical treatment of the data, particularly the electric bill and rate data, was accomplished largely through the use of the Hollerith machine tabulating equipment

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available in the Sorting and Tabulating Machine Station of the University of Michigan, where all the technical Hollerith machine work in connection with my studies was performed by a highly trained technical staff and supervised by the department head who directs all similar work passing through that division of the University.

Q. What is this Hollerith tabulating equipment and these Hollerith machine cards to which you have referred? A. The Hollerith cards are cards used in the operation of the Hollerith tabulating equipment. The Hollerith tabulating equipment is essentially a series of machines, manufactured and leased by International Business Machines Corporation, which are frequently and customarily used in connection with complicated and comprehensive statistical studies and compilations. These machines use a standard sized card with holes punched in it as the basis of their operation. The essential data which is to be studied statistically is punched into the cards directly or by the use of code numbers. The machines are so constructed that they can sort and tabulate the data thus punched into the cards.

Machines are available that divide and multiply as well as sort, add and subtract the data punched on the cards. For example, if I have 18,000 F.P.C. Form No. 69 cards, each representing a community in the United States and punched with the F.P.C. electric bill and rate data, and I wish to find out the weighted average cost of 25 KWH of electricity in all communities having a population over 50,000, I would first put the 18,000 cards through a sorter which would be set to pick out only those cards whose punches showed a community having a population of over 50,000. This operation would give me in a very few minutes the small handful of cards (189 to be exact) representing cities with a population of over 50,000. I would then put this selected group of cards through a "multiplier," which is a calculating machine which could be adjusted so as to produce the product of the population and the typical bill for 25 KWH of electricity, if this product had not already been punched in the card. The cards would then be run through another machine which would total such products

and which would also total the population figures. The division of the latter sum into the former would give me the weighted average cost of 25 KWH of electricity in all cities of the United States with a population of over 50,000.

Q. Are these machines accurate? A. They are completely accurate when operated by competent personnel.

Q. Were the personnel which operated the Hollerith machines in connection with your studies competent? A. Entirely so. I might add that I am prepared at any time to discuss the system of controls which I employed in order to insure the absolute accuracy of the statistical processes employed in the studies.

Q. Have you caused to be prepared an exhibit which lists or names every one of the operating utilities and holding companies included in your studies? A. Yes.

(Have Exhibit III-2 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (III-2) prepared under your supervision? A. Yes.

Q. Do you believe it to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (III-2). A. It is an alphabetical list of all operating utilities and holding companies on which my studies are based and includes the 366 unclassified companies to which I previously referred. It was produced by the Hollerith machine from the original data as punched on the Federal Power Commission Hollerith cards. It shows for each utility listed thereon the code number with respect to several of the bases of classification used, the Federal Power Commission's State and utility number, the dollar amount of sales of electricity to ultimate consumers, and the Securities and Exchange Commission's serial number for each related holding company. The list also contains a key to the various code numbers which makes it possible to interpret the several bases of classification.

(Here offer Exhibit ..... (III-2) for Identification in evidence.)

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Q. You have indicated, Dr. Waterman, that most of the data on which your studies are based relate either to the year 1939 or to the date January 1, 1940. Why did you select as the basis for your studies data for said year and said date? A. Counsel for respondents stated at the outset that they wanted my studies based upon present facts and conditions. Accordingly, I always used data which were the latest and most recent which could be secured at the time my studies were under way. Since most of my statistical analyses were carried on during the calendar year 1940, my choice of electric bill and rate data was thus limited to that published by the Federal Power Commission as of January 1, 1940. The latest financial and utility operating data available in 1940 were obviously those applicable to the fiscal and corporate year 1939.

Q. Do you consider that your data covers a sufficient period of time to insure its statistical reliability for the purpose of your studies? A. Yes. The whole object of my studies was to establish *relationships* between various groupings of operating utilities classified on various bases. Little or no attention has been paid to the actual performance or position of any one utility of any group of utilities with respect to any of the factors analyzed. Moreover, the comparisons dealt with in my studies are based on continuing or long-run conditions which do not change rapidly. There is no question but that 1939 data afford a picture which is accurately representative of *relative* conditions as they exist at the present time.

Q. I note that in arriving at the various population figures and averages shown on Exhibit ..... (III-1) you utilized the 1930 United States census. Why did you not use the 1940 census figure? A. The answer to that question will be made clear at a later point. I might say now, however, that there are no differences between 1930 and 1940 population figures which would affect any of my studies.

Q. Have you completed the description of means and methods which you have employed in classifying operating utilities for the purposes of your studies, of the sources

of the data upon which your studies are based, and of the statistical methods used in assembling and preparing such data? A. In a general way, yes. It will be necessary to discuss some of these matters in more detail, and to furnish certain additional explanatory information, in connection with some of the individual studies and exhibits.

Exhibit .....

III-1
(VI-A-1-b)

CHARACTERISTICS OF SAMPLE USED IN STUDY OF THE ECONOMIES OF PUBLIC UTILITY HOLDING COMPANIES AS APPLIED TO ELECTRIC UTILITIES AS OF 1939

* Counted in each state in which they serve.

† As reported to the Federal Power Commission.

‡ According to 1930 U. S. Census.

1. Make-up of Sample

Code	Control Class Description	Number of Companies*	Sales to Ultimate Consumers†		Population Served‡		Communities Served		Average Population	
			Amount (000)	Per Cent of Total	Number	Per Cent of Total	Number	Per Cent of Total	Per Company	Per Community
0	Independent unit companies	122	$ 455,917	22.29	14,172,796	19.48	1,913	10.71	116,170	7,409
1	Units of exempt holding Company systems	58	164,674	8.05	6,601,945	9.07	856	4.79	113,827	7,713
2	Mutual service subs.—No. 794	69	287,161	14.04	10,679,303	14.68	2,607	14.60	154,773	4,096
3	Mutual service subs.—Part 794	148	299,958	14.67	10,991,691	15.11	3,118	17.46	74,268	3,525
4	Mutual serv. subs.—all 794	107	410,844	20.09	14,590,019	20.05	5,521	30.92	136,355	2,643
5	Non-serv. subs.—over 75% vote	121	247,662	12.11	8,968,864	12.33	2,798	15.67	74,123	3,205
6	Non-serv. subs.—50% to 75% vote	4	14,805	0.72	516,957	0.71	163	0.91	129,239	3,172
7	Non-serv. subs.—less than 50% vote	5	77,895	3.81	2,950,127	4.05	555	3.11	590,025	5,316
8	Jointly owned companies	2	86,155	4.21	3,288,908	4.52	325	1.82	1,644,454	10,120
0+1+8	*"Independents"*	182	706,746	34.56	24,063,649	33.07	3,094	17.33	132,218	7,778
2+3+4	Mutual service subsidiaries	324	997,963	48.80	36,261,013	49.84	11,246	62.98	111,917	3,224
5+6+7	Other subs.—registered	130	340,362	16.64	12,435,948	17.09	3,516	19.69	95,661	3,537
2 to 7	*"Holding company subs."*	454	1,338,325	65.44	48,696,961	66.93	14,762	82.67	107,262	3,299
Total	All classified companies	636	$2,045,071	100.00	72,760,610	100.00	17,856	100.00	114,403	4,075

2. Character and Extent of the Sample

Total sales to ultimate consumers as reported by the Edison Electric Institute for 1939	$2,293,644,000
Sales by publicly owned utilities as reported by the United States Census for 1939	154,976,000
Balance to be accounted for by privately owned utilities	$2,138,668,000
Sample (above) includes private companies reporting total sales to ultimate consumers on Federal Power Commission Form 1s, 96's and 97's	$2,045,071,000
Sample as per cent of total private utility sales to ultimate consumers	95.62%

Excluded from the same for lack of complete or comparable data are 366 companies reporting to the Federal Power Commission. These companies are reported as serving a population of 363,376 in 546 communities.

Exhibit III-2.

Detailed Classification and Key (Hollerith)

(Copy of this sheet was filed with original of Document No. 392 in pocket on last page thereof.)

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Q. And now, Professor Waterman, I direct your attention to the first major group of your studies, namely, those covering the relationship between the character of control over utilities and the objectives of the Act. First, at the risk of some repetition, will you please give a brief general description thereof? A. Their general character has already been indicated. Briefly, the first group of studies is designed to determine whether the fact that an operating utility is controlled by a holding company has any relationship, and if so, what relationship, to four factors, namely, (1) cost of electric service to consumers, (2) economy in management and operation of utilities, (3) soundness of financial management of utilities, and (4) protection of investors in utility securities.

Q. Referring now to the first section of the first group of studies, namely, your study as to whether the character of control over utilities bears any relation to the cost of utility service to consumers, have you caused to be prepared a table entitled "Average Typical Electric Bills Charged by Independent and Holding Company Subsidiary Utilities, as of January 1, 1940"? A. Yes.

(Have Exhibit IV-A-1 marked Exhibit ..... for Identification.)

Q. Was this table, Exhibit ..... for Identification (IV-A-1), prepared by you or under your supervision? A. Yes.

Q. Do you believe it to be accurate? A. I do.

Q. Will you briefly describe Exhibit ..... for Identification (IV-A-1)? A. It is a table which shows as to the two major groups of electric utilities to which I have already referred, namely, 182 independent utilities and 454 holding company subsidiaries, the average typical bills for 25, 100 and 250 KWH of electricity, respectively. Said average bills are based on residential electric rates and have been weighted by the population served at each rate. The table also shows, in respect of each of said groups of electric utilities, both actually and by percentages, the population

served by each group, the number of communities served by each group, and the dollar amounts of sales of electricity to ultimate consumers of each group. It also shows the average population, per community and per company, served by each group; the average number of communities per company served by each group; and the average dollar amounts of sales of electricity, per capita, per community and per company, of each group.

Q. Does Exhibit ..... for Identification (IV-A-1) show on its face the source of the data set forth thereon? A. It does.

Q. Will you state why Exhibit ..... for Identification (IV-A-1) is confined to *residential* electric bills? A. Clearly, the most important class of electric service to the public at large is residential service, 80% of the total electric customers being in that class. Furthermore, from the point of view of the policy of the Act, as disclosed in Section 1 thereof, there would seem to be much less reason to be concerned about the users of industrial or commercial electricity than the users of residential electricity since the former, particularly the users of industrial power, tend to be protected from excessive charges by actual and potential competition in the form of alternative sources of heat and power. As a matter of fact, it is evident even among residential consumers of electricity, as shown by Exhibit ..... for Identification (IV-A-1) and other exhibits to which I shall later refer, that differences in bills for 250 KWH of electricity are less significant percentagewise than bills for 25 KWH of electricity, a phenomenon which is to be expected in view of the fact that all electric utilities must invade a competitive field to attract the cooking and heating loads which are necessary to bring the monthly residential use of electricity to as high a point as 250 KWH.

Another important reason for confining the study to residential rates is the necessity for applying a weighting factor to the bills. The population weighting factor used throughout this and subsequent similar tables is logically applicable only to situations in which the number of customers of the utilities and the population served thereby

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are themselves closely correlated. This situation is unquestionably true generally in the case of residential electric bills but may not be true in the case of commercial or industrial electric bills. To state it differently, the true situation with respect to consumers of commercial and industrial electricity is less apt to be truly represented by population weighting of commercial or industrial electric bills because the number of such customers may or may not vary in direct proportion to population served.

Q. You speak of "weighting by population" and "weighting factors," and state that it is necessary to "weight" the average electric bills according to the population served at each rate. Will you indicate why this is necessary for your purposes? A. Bear in mind that the basis of my several cost of electricity comparisons is the average typical bills for each of three use levels, namely, 25, 100 and 250 KWH of electricity, in each community of 250 population or over in the United States. It is quite obvious that the typical electric bill in a small community of 250 population should not count as much in making up the average as the typical electric bill in a larger community. The best measure of the weight which should be given to each bill in making up the average would appear to be the population of the community. When working in a field as broad as the one covered by this study, it is entirely reasonable to assume that the universal application of population weighting serves to establish an accurate measure of the impact of electric rates upon the consuming public.

Q. Did you consider weighting the electric bills by the number of residential customers served in each community? A. Yes, I did consider that method of approach. Such a weighting process would fail to recognize the influence of the available rate on potential customers comprising that portion of the population not already taking electric service but to whom such service is available. Furthermore, the particular approach is definitely precluded by lack of complete data.

Q. What population figures did you use for weighting the average typical electric bills and why? A. The average bills were weighted by the population of each community served according to the 1930 United States Census. In cases of communities where competition existed, the population of the community for weighting purposes was divided among the utilities serving it proportionately to the number of customers of each. 1930 Census figures were used, rather than 1940 census figures, because the Federal Power Commission had published its data on the 1930 census basis and, as I have stated, the F.P.C. data were adopted for purposes of my studies. Furthermore, the 1940 census figures were not fully available when I commenced the studies.

Q. Did you subsequently make a study to determine the percentage of population changes in the several States during the decade 1931 to 1940? A. Yes.

Q. And in that connection, did you cause to be prepared a table entitled, "Distribution of United States Population by States, 1930 and 1940"? A. Yes.

(Have Exhibit IV-A-1-a marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-A-1-a) prepared under your supervision? A. Yes.

Q. Do you believe it to be accurate? A. I do.

Q. From what sources was Exhibit ..... for Identification (IV-A-1-a) prepared. A. From United States census reports for 1930 and 1940.

Q. What does Exhibit ..... for Identification (IV-A-1-a) indicate with respect to the point you have just been discussing? A. It shows the percentage of the total population of the nation in each State according to both the 1930 census and the 1940 census. The respective percentage figures appear in parallel columns. It is apparent at a glance at these parallel columns that while there were shifts in the percentages in population in the several States during the decade 1931 to 1940, such shifts were not sufficient rela-

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tively to invalidate or to affect in any important manner the weighting of the 1940 average typical electric bills on the basis of the 1930 census figures.

Q. Why did you choose average electric bills for 25, 100, and 250 KWH of electricity, respectively as the measure of the cost of electric service to consumers, and why do you refer to such bills as "typical bills"? A. I chose the bills for these three use levels, first, because the data was available for said three use levels in the published reports of the Federal Power Commission and, second, because I agree with the reasons of the Federal Power Commission for selecting these three use levels as "typical." The F.P.C. in numerous publications has explained its choice of these three use levels as typical use levels by pointing out that 25 KWH per month represents the class of customers which uses electric energy for lighting and small appliances; that 100 KWH per month represents the class of customers which uses electric energy for refrigeration in addition to lighting and small appliances; and that 250 KWH per month represents the class of customers which uses electric energy for cooking in addition to refrigeration, lighting and small appliances.

Q. In your opinion does the study set forth on Exhibit ..... for Identification (IV-A-1) fairly and accurately measure the relationship of character of control over electric utilities to the cost of electric service to consumers? A. Yes. In spite of the fact that, in most states of the Union, the residential consumer of electricity is accorded some form of regulatory protection, it is fairly presumed that his electric bills will be affected by certain characteristics over which regulation has no or but nominal control, and that within the range of regulatory limits certain types of utilities may sell current more cheaply than other types of utilities. A study of electric bills which fairly encompasses the entire private electric industry of the country should reflect, and in my opinion, my studies do reflect, the relationship between holding company control and the cost of electric service.

(Here offer Exhibits ..... (IV-A-1) and ..... (IV-A-1-a) for Identification in evidence.)

Q. What does Exhibit ..... (IV-A-1) indicate with respect to the relationship between the character of control over electric utilities and the cost of electric service to consumers? A. It shows that throughout the United States people served by private electrical utilities consistently enjoy somewhat more favorable rates for residential service from holding company subsidiaries than from independent utilities, a fact which is shown to be true at all three use levels in respect of which the data are presented. More specifically, the Exhibit shows that, as of January 1, 1940, the average typical bill of the independent electric utilities in the United States for 25 KWH of electricity is $1.56, as compared with the figure of $1.47 for electric utilities which are holding company subsidiaries and as compared with the figure of $1.50 for all private electric utilities in the country included in my sample; that the average typical bill of the independent electric utilities for 100 KWH of electricity is $4.34, as compared with the figure of $4.11 for electric utilities which are holding company subsidiaries and as compared with the figure of $4.19 for all private utilities included in my sample; that the average typical bill of the independent electric utilities for 250 KWH of electricity is $7.79, as compared with the figure of $7.43 for holding company subsidiaries and the figure of $7.55 for all private utilities included in my sample.

Q. Would you say that these differences are statistically significant? A. In my opinion the differences are statistically significant in view of the fact that these average figures cover the country as a whole.

Q. I note that Exhibit ..... (IV-A-1) lists 366 companies under the column headed "Unclassified." What are these companies? A. These are the 366 small operating utilities to which I referred some time ago which have not been included in my complete sample because of lack of adequate data with respect to said companies. Electric bill data with respect to said 366 companies are, however,

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available, and accordingly I have set forth such data with respect to said 366 companies in this exhibit and in subsequent exhibits dealing with weighted average electric bills. As I pointed out before, all of these 366 companies are independent utilities and for purposes of this particular exhibit and all other exhibits dealing with weighted average electric bills said companies could properly have been included as independent utilities.

Q. How would the figures as to the weighted average bills of independent utilities have been affected if the companies which you have grouped under the heading "Unclassified" on Exhibit ..... (IV-A-1) had been included with the independent utilities? A. The weighted average bills of said 366 small operating utilities are, at each of the three use levels, considerably higher than those of the 182 utilities which are classified in this and subsequent Exhibits as independent utilities. The necessary effect of including the said 366 unclassified companies as independent utilities would be, of course, to raise somewhat the weighted average bills of the independent utilities group at each of the three use levels.

Q. Does Exhibit ..... (IV-A-1) indicate certain differences in characteristics which accompany the differences in the average electric bills of independent utilities as compared with the average electric bills of holding company subsidiaries? A. Yes. The average populations both per company and per community, served by electric utilities which are holding company subsidiaries are distinctly smaller than the average populations served by the independent electric utilities. The sales of electricity per capita for all utilities are remarkably consistent, which fact, coupled with the population differences mentioned, leads logically to the noticeably smaller sales of electricity per community and per company by the holding company subsidiaries.

Q. In view of such distinctive characteristics, did you cause to be prepared certain exhibits designed to assist in the analysis of the relationships between the size of the community served by electric utilities, the bills charged by

utilities in communities of varying sizes, and the differences between the cost of electric service furnished by independent and holding company utilities within each community size group? A. Yes.

(Here have Exhibits IV-A-2-a to 2-e marked as Exhibits ..... to ..... respectively, for Identification.)

Q. Were Exhibits ..... to ..... for Identification (IV-A-2-a to 2-e) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Do they show on their face the sources of the data set forth therein? A. They do.

Q. Will you describe Exhibits ..... to ..... for Identification (IV-A-2-a to 2-e)? A. Exhibits ..... to ..... for Identification comprise a breakdown of the data set forth on Exhibit ..... (IV-A-1) according to communities of varying populations. Thus, Exhibit ..... for Identification (IV-A-2-a) is a table showing, as of January 1, 1940, the weighted average typical bills for 25, 100, and 250 KWH of electricity, respectively, charged by independent utilities and holding company subsidiaries in communities of a population of 250 to 999. It also shows, in respect of both independent utilities and holding company subsidiaries, the population served by each type of company in communities of the size stated, the number of such communities served by each type of company and the average population per community served by each type of company. It also shows the proportion of all residential electricity sold in communities having a population between the limits specified.

Exhibits ..... to ..... for Identification (IV-A-2-b to 2-e) are exactly similar in character to Exhibit ..... for Identification (IV-A-2-a) except that they deal with groups of communities of different sizes. Thus, Exhibit ..... for Identification (2-b) deals with communities having a population of 1,000 to 2,499; Exhibit ..... for Identification (2-c) with communities having a population of 2,500 to 9,999,

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Exhibit ..... for Identification (2-d) with communities having a population of 10,000 to 49,999, and Exhibit ..... for Identification (2-e) with communities having a population of over 50,000.

Q. What suggested to you the particular size of community classifications used in these Exhibits? A. They are the classifications which are consistently used by the Federal Power Commission in assembling and reporting similar data.

(Here offer Exhibits ..... to ..... for Identification (IV-A-2-a to 2-e) in evidence.)

Q. Have you prepared a chart setting forth graphically the data which appears on Exhibits ..... to ..... (IV-A-2-a to 2-e)? A. Yes, I have.

(Have Chart IV-A-3 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-A-3) prepared by you or under your immediate supervision? A. Yes.

Q. Do you believe it to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-A-3). A. In light of my explanation of Exhibits ..... to ..... (IV-A-2-a to 2-e) and the legends at the bottom of the chart, I believe it is almost self-explanatory. The bars with diagonal lines on the chart are replicas of the electric bill data contained in tabular form in respect of independent utilities and holding company subsidiaries as shown on Exhibits ..... to ..... (IV-A-2-a to 2-e). The five groups of bars correspond to the several community sizes as indicated. The percentage figure under each group indicates the proportionate significance of each size group of communities to the country as a whole, measured by population served. The width of the bars was made proportionate to said percentage figures to convey graphically the idea of the number of people in each size group. The vertical scale on the chart is logarithmic and the horizontal scale is natural.

Q. What is a logarithmic scale as compared with a natural scale, and why did you use such scales as you did on this chart? A. A natural scale is one drawn on a straight arithmetic basis whereas a logarithmic scale is one drawn on a percentage basis. In this chart the natural scale is used on the horizontal axis,—that is, in measuring the width of the bars, to show the actual differences between the populations served by the utilities in the several company size groups. The data represented on the horizontal axis,—that is, by the width of the bars, are of such a nature that they should be compared actually and directly. Accordingly, the natural scale is used for that purpose. The logarithmic scale is used on the vertical axis,—that is, in measuring the height of the bars, to emphasize the percentage or relative differences in typical average electric bills rather than the actual dollar differences in such average bills. It will be noted from the chart that the span of $1 on the vertical axis at the left of the chart decreases steadily as the scale ascends. Thus, a difference, for example, of $1 around the $8 level occupies less span on the vertical axis than the same difference of $1 at, say, the $1.50 level. I might add that the use of a logarithmic or ratio scale for presenting comparisons of the types indicated by the vertical scale on this chart is standard statistical practice because it affords usually an accurate picture of the facts and their relative importance.

(Here offer Exhibit ..... for Identification (IV-A-3) in evidence.)

Q. What do the tables which are Exhibits ..... to ..... (IV-A-2-a to 2-e) and the chart which is Exhibit..... (IV-A-3) indicate with respect to the relative cost of rendering residential electric service as between independent utilities and holding company subsidiaries? A. These Exhibits serve statistically to reinforce Exhibit ..... (IV-A-1) and demonstrate the universal tendency of holding company subsidiaries to sell electricity at lower average rates than independent electric utilities. They show that in each size of community classified the average bills of

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holding company subsidiaries for 25, 100 and 250 KWH of electricity, respectively, are as low or lower than the corresponding bills of independent utilities. In fact, the average bills of the holding company subsidiaries are lower in each size community and at each of the three use levels than the corresponding bills of independent utilities except in one situation where the corresponding averages are identical.

Q. What do Exhibits ..... to ..... (IV-A-2-a to 2-e) and the chart which is Exhibit ..... (IV-A-3) indicate with respect to the relative level of electric bills in communities of different sizes? A. These Exhibits demonstrate statistically that residential customers in large communities pay less for electric current on the average than do customers in small communities. In fact, there appears to be a definite tendency for the cost of electricity to increase steadily as the size of community decreases, and this tendency for increasing cost continues throughout all the size of community classifications employed.

Q. Have you any other comments to make in respect of Exhibits ..... to ..... (IV-A-2-a to 2-e and IV-A-3)? A. I might point out that they show that holding company subsidiaries have the greatest margin of superiority, in terms of low electric bills, in communities of over 50,000 population. In such communities the average bills of holding company units at all three use levels are farthest below the average bills of independent utilities. There is also a tendency for more spread in the communities of the smallest size group. In all other size groups the differences are less marked, but in no instance is the average bill of holding company units above the average bill of independent utilities. This consistent superiority on the part of holding company subsidiaries, so far as average electric bills are concerned, is all the more significant when we consider that, as shown on Exhibit ..... (IV-A-1), the average population per community served by holding company subsidiaries is very substantially less than the average population served per community by independent utilities. This means, of course, that the great majority of the small

communities of the country are served by holding company subsidiaries and, as we have seen, there is a definite tendency for electric bills to be higher in small communities than in large communities.

Q. Have you any opinion as to why the holding company subsidiaries exhibit a more pronounced superiority in the smaller sized communities? A. The situation may possibly be in part explained by the fact that independent utilities operating in small communities are apt to be small companies, whereas holding company units operating in the same sized community are apt to be sizable companies operating in a number of communities. This conclusion is borne out by the fact, shown on Exhibit ..... (IV-A-1), that independent utilities serve on the average 17 communities per company, whereas holding company units serve on an average 32.5 communities per company.

Q. Now, Professor Waterman, have you made a further classification of electric utilities by geographic districts to determine whether there exist any significant differences, as between various sections of the country, in the cost of electric service supplied by independent utilities and holding company subsidiaries? A. I have.

(Have Exhibits IV-A-4-a to 4-i marked Exhibits ..... to ..... for Identification.)

Q. Were Exhibits ..... to ..... for Identification (IV-A-4-a to 4-i) prepared by you or under your supervision? A. Yes.

Q. Do you believe them to be accurate? A. I do.

Q. Will you briefly describe Exhibits ..... to ..... for Identification (IV-A-4-a to 4-i). A. These Exhibits are a breakdown of the data set forth in Exhibit ..... (IV-A-1) according to nine geographic areas covering the entire United States. For example, Exhibit ..... for Identification (IV-A-4-a) is a table showing, as of January 1, 1940, the weighted average typical electric bills for 25, 100 and 250 KWH of electricity charged, respectively, by independent utilities and by holding company subsidiaries in the New

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England States. It also shows, as to both groups of utilities, the population served, the number of communities served, and the average population per community served.

Exhibits ..... to ..... for Identification (IV-A-4-b to 4-i) are exactly similar in character except that they deal with different geographic areas. Thus, Exhibit ..... for Identification (IV-A-4-b) deals with the Middle Atlantic States; Exhibit ..... for Identification (IV-A-4-c) deals with the East North Central States; Exhibit ..... for Identification (IV-A-4-d) with the West North Central States; Exhibit ..... for Identification (IV-A-4-e) with the South Atlantic States; Exhibit ..... for Identification (IV-A-4-f) with the East South Central States; Exhibit ..... for Identification (IV-A-4-g) with the West South Central States; Exhibit ..... for Identification (IV-A-4-h) with the Mountain States; and Exhibit ..... for Identification (IV-A-4-i) with the Pacific States.

Q. What determined your division of the 48 States into the particular 9 geographical subdivisions which you have employed in Exhibits ..... to ..... for Identification (IV-A-4-a to 4-i)? A. The nine geographic subdivisions utilized in these tables correspond with those selected by the Federal Power Commission in assembling and reporting data concerning electricity rates and bills. I refer, for example to F.P.C. Report R-17, at page 2.

(Here offer Exhibits ..... to ..... (IV-A-4-a to 4-i) for Identification in evidence.)

Q. What do Exhibits ..... to ..... (IV-A-4-a to 4-i) indicate with respect to the particular point you have been discussing? A. These Exhibits further support the conclusions indicated by Exhibit ..... (IV-A-1). They set forth comparisons between the average electric bills of independent utilities and holding company subsidiaries in nine different geographic areas and they disclose that in all but three of these areas the bills of holding company subsidiaries are lower than those of independent utilities.

To state the matter differently, comparison of costs of electricity to consumers in the several geographic areas re-

veals that in six out of the nine areas the customers of holding company subsidiaries pay less, on the average, for electric current, at all three residential use levels, than do the customers of independent utilities. The three instances to the contrary occur in the New England States, the East North Central States, and the South Atlantic States. In the New England States the holding company subsidiary bills are higher than those of the independents for 25 and 100 KWH, but lower for 250 KWH. In the East North Central area, the holding company subsidiary bills are slightly lower than those of the independent utilities for 25 and 100 KWH, but higher for 250 KWH. In the South Atlantic States, as in the New England States, the bills of holding company subsidiaries are higher than those of the independent utilities at the 25 and 100 KWH use levels, but lower at the 250 KWH use level.

Q. How do you explain the fact that in five of the twenty-seven comparisons by geographic areas the average bills of independent utilities are somewhat lower, at various use levels, then the average bills of holding company subsidiaries? A. In each of said five areas, as shown on Exhibits ..... (IV-A-4-a), ... (IV-A-4-c), and ..... (IV-A-4-e), the two types of companies are so distributed that the independent utilities serve the larger communities; in fact in every one of the very few instances where the average bills of the independents are lower than those of the holding company subsidiaries, the average size of community served by the independents is more than twice the average size of the community served by the holding company subsidiaries. There is definite evidence in Exhibit ..... (Chart IV-A-3) and in its supporting tabular exhibits that electricity for residential uses is supplied more economically in large communities than in small communities. In fact, it clearly appears that the larger the community the lower are the electric bills. This relationship between the size of community served and the cost of electric service to consumers is so clearly established by the Exhibits which I have presented that it may be definitely concluded that the factor of size of community served is often so important

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as to outweigh other factors affecting the cost of electricity to consumers. But, while I am satisfied that the factor of size of community served is a most important element affecting the cost of rendering electric service to consumers, nevertheless, the consistency with which the average electric rates of independent utilities exceed those of holding company subsidiaries throughout the United States, at all use levels and in communities of all sizes, inhibits the conclusion that the element of size of community served is the only important factor affecting differences in electric rates.

Q. Have you completed the description of your study to determine the relationship between the character of control over electric utilities and the cost of electric service to consumers? A. Yes, but I should point out that various breakdowns of the data which will be presented in subsequent studies will later be referred to as supporting the conclusions I have already indicated. This presentation which I am just completing has shown the overall bill data weighted by population for holding company subsidiaries and independents, and has broken down the overall averages by size of community served and by geographic area. In the next following section, dealing with economy of operation as related to type of control, the rate data will be presented by companies, and again in the second major division of the studies, dealing with the relationships of size, the data will be presented in still another way, by size of company. It should be noted, as these various breakdowns are presented, that whatever the method of classification of the data, the same conclusion as to the relationship of control always appears. These additional presentations of data will serve to fortify and substantiate the conclusions recited here with regard to the relationships between average typical electric bills paid by consumers and the type of company control.

Q. Will you state your general conclusions with respect to the studies comprising the first section of your first major group of studies? A. In my opinion there are significant and consistent differences between the average electric bills charged by independent utilities and those charged

by holding company subsidiaries. A small but definite advantage appears to accrue to residential consumers of electricity served by holding company subsidiaries, as opposed to those served by independent utilities, at all three use levels, regardless of the size of community involved and almost completely regardless of geographical location. The consistency of the averages developed from the several classifications serves forcibly to establish the soundness and reasonableness of the conclusion that whatever advantages may exist, so far as average cost of electric service is concerned, are possessed by customers served by holding company subsidiaries rather than by customers served by independent utilities.

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Exhibit .....

IV-A-1
(I-A-1)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES, AS OF JANUARY 1, 1940

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills*				
25 Kwh	$1.56	$1.47	$1.50	$2.34
100 Kwh	4.34	4.11	4.19	5.94
250 Kwh	7.79	7.43	7.55	10.90
Population Served†				
Number	24,063,649	48,696,961	72,760,610	363,376
Per Cent of Total	33.07%	66.93%	100.00%	
Communities Served				
Number	3,094	14,762	17,856	546
Per Cent of Total	17.33%	82.67%	100.00%	
Sales to Utimate Consumers				
Amount (000)	$706,746	$1,338,325	$2,045,071	
Per Cent of Total	34.56%	65.44%	100.00%	
Number of Companies‡	182	454	636	366
Average Population				
Per Community	7,778	3,299	4,075	666
Per Company‡	132,218	107,262	114,403	993
Average Number of Communities per Company‡	17.0	32.5	28.1	1.5
Average Sales				
Per Capita	$29.37	$27.48	$28.11	
Per Community (000)	$228	$91	$115	
Per Company (000)	$3,883	$2,948	$3,216	

*Weighted by "Population Served."
†According to 1930 U. S. Census.
‡Companies counted in each state in which they serve.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-1-a
(VI-B)

DISTRIBUTION OF UNITED STATES POPULATION BY STATES; 1930 AND 1940

(U. S. Census Bureau)

	Per Cent of Total	
	1940	1930
Alabama	2.15	2.16
Arizona	.38	.35
Arkansas	1.48	1.51
California	5.14	4.62
Colorado	.85	.84
Connecticut	1.30	1.31
Delaware	.20	.20
District of Columbia	.50	.40
Florida	1.44	1.20
Georgia	2.36	2.37
Idaho	.40	.36
Illinois	6.00	6.22
Indiana	2.60	2.64
Iowa	1.93	2.01
Kansas	1.37	1.53
Kentucky	2.16	2.13
Louisiana	1.80	1.71
Maine	.64	.65
Maryland	1.38	1.33
Massachusetts	3.28	3.46
Michigan	3.99	3.94
Minnesota	2.12	2.09
Mississippi	1.66	1.64
Missouri	2.87	2.96
Montana	.42	.44
Nebraska	1.00	1.12
Nevada	.08	.74
New Hampshire	.37	.38
New Jersey	3.16	3.29
New Mexico	.40	.34
New York	10.24	10.25
North Carolina	2.71	2.58
North Dakota	.49	.55
Ohio	5.25	5.41
Oklahoma	1.77	1.95
Oregon	.83	.78
Pennsylvania	7.52	7.84
Rhode Island	.54	.56
South Carolina	1.44	1.42
South Dakota	.49	.56
Tennessee	2.21	2.13
Texas	4.87	4.74
Utah	.42	.31
Vermont	.27	.29
Virginia	2.03	1.97
Washington	1.32	1.27
West Virginia	1.44	1.41
Wisconsin	2.38	2.39
Wyoming	.19	.18

TOTAL POPULATION

1940	131,669,275
1930	122,775,046

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Exhibit .....

IV-A-2-a
(I-E-i-a)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN COMMUNITIES OF 250-999 POPULATION AS OF JANUARY 1, 1940

(7.7 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills*				
25 Kwh	$1.91	$1.77	$1.79	$2.56
100 Kwh	4.89	4.64	4.68	6.39
250 Kwh	8.42	8.02	8.08	11.52
Population Served†				
Number	860,873	4,768,863	5,629,736	210,802
Per Cent of Total	15.29%	84.71%	100.00%	
Communities Served				
Number	1,764	10,025	11,789	466
Per Cent of Total	14.96%	85.04%	100.00%	
Average Population per Community	488	476	478	453

*Weighted by "Population Served."
†According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-2-b
(I-E-1-b)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN COMMUNITIES OF 1,000-2,499 POPULATION AS OF JANUARY 1, 1940

(6.7 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills*				
25 Kwh	$1.73	$1.70	$1.70	$2.24
100 Kwh	4.60	4.52	4.54	5.69
250 Kwh	8.11	7.91	7.95	10.38
Population Served†				
Number	981,812	3,901,457	4,883,269	92,393
Per Cent of Total	20.11%	79.89%	100.00%	
Communities Served				
Number	643	2,616	3,259	67
Per Cent of Total	19.73%	80.27%	100.00%	
Average Population per Community	1,527	1,491	1,498	1,379

* Weighted by "Population Served."
† According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

V-A-2-c
I-E-1-c)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN COMMUNITIES OF 2,500-9,999 POPULATION AS OF JANUARY 1, 1940

(12.3 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills*				
25 Kwh	$1.62	$1.62	$1.62	$1.90
100 Kwh	4.50	4.41	4.43	5.11
250 Kwh	7.95	7.83	7.86	10.20
Population Served†				
Number	2,301,015	6,673,821	8,974,836	36,877
Per Cent of Total	25.64%	74.36%	100.00%	
Communities Served				
Number	471	1,441	1,912	12
Per Cent of Total	24.63%	75.37%	100.00%	
Average Population per Community	4,885	4,631	4,694	3,073

*Weighted by "Population Served."
†According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit ____

IV-A-2-d
(I-E-1-d)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN COMMUNITIES OF 10,000-49,999 POPULATION AS OF JANUARY 1, 1940

(18.8 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills*				
25 Kwh	$1.60	$1.51	$1.53	$1.38
100 Kwh	4.43	4.22	4.27	4.20
250 Kwh	8.07	7.67	7.77	8.45
Population Served†				
Number	3,403,143	10,272,780	13,675,923	23,304
Per Cent of Total	24.88%	75.12%	100.00%	
Communities Served				
Number	168	539	707	1
Per Cent of Total	23.76%	76.24%	100.00%	
Average Population per Community	20,257	19,059	19,344	23,304

* Weighted by "Population Served."
† According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-2-e
(I-E-1-e)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN COMMUNITIES OF OVER 50,000 POPULATION AS OF JANUARY 1, 1940

(54.5 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills*				
25 Kwh	$1.51	$1.31	$1.39	None
100 Kwh	4.26	3.79	3.99	"
250 Kwh	7.66	7.01	7.28	"
Population Served†				
Number	16,516,806	23,080,040	39,596,846	None
Per Cent of Total	41.71%	58.29%	100.00%	"
Communities Served				
Number	48	141	189	None
Per Cent of Total	25.40%	74.60%	100.00%	"
Average Population per Community	344,100	163,688	209,507	None

*Weighted by "Population Served."
†According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit _____

IV-A-4-a
(I-F-1-a)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN NEW ENGLAND;* JANUARY 1, 1940

(9.49 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.63	$1.74	$1.69	$2.48
100 Kwh	4.69	4.74	4.72	5.71
250 Kwh	8.71	8.63	8.66	9.76
Population Served‡				
Number	2,872,853	4,028,944	6,901,797	42,924
Per Cent of Total	41.62%	58.38%	100.00%	
Communities Served				
Number	317	983	1,300	57
Per Cent of Total	24.38%	75.62%	100.00%	
Average Population per Community	9,063	4,099	5,309	753

* States included: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.
† Weighted by "Population Served."
‡ According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-4-b
(I-F-1-b)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE MIDDLE ATLANTIC STATES;* JANUARY 1, 1940

(31 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.69	$1.52	$1.60	$2.14
100 Kwh	4.68	4.30	4.49	5.51
250 Kwh	8.30	7.52	7.91	9.79
Population Served‡				
Number	11,173,856	11,380,583	22,554,439	17,604
Per Cent of Total	49.54%	50.46%	100.00%	
Communities Served				
Number	724	3,131	3,855	23
Per Cent of Total	18.78%	81.22%	100.00%	
Average Population per Community	15,434	3,635	5,851	765

*States included: New Jersey, New York, and Pennsylvania.
†Weighted by "Population Served."
‡According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit ____

IV-A-4-c
(I-F-1-c)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE EAST NORTH CENTRAL STATES;* JANUARY 1, 1940

(23.96 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.38	$1.36	$1.37	$2.03
100 Kwh	3.80	3.78	3.78	5.27
250 Kwh	6.82	7.03	6.98	9.37
Population Served‡				
Number	4,525,841	12,904,817	17,430,658	42,522
Per Cent of Total	25.96%	74.04%	100.00%	
Communities Served				
Number	354	3,137	3,491	71
Per Cent of Total	10.14%	89.86%	100.00%	
Average Population per Community	12,785	4,114	4,993	599

* States included: Illinois, Indiana, Michigan, Ohio, and Wisconsin.
† Weighted by "Population Served."
‡ According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-4-d
(I-F-1-d)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE WEST NORTH CENTRAL STATES;* JANUARY 1, 1940

(8.34 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.68	$1.43	$1.46	$2.14
100 Kwh	4.82	3.98	4.07	5.30
250 Kwh	8.17	7.36	7.45	9.79
Population Served‡				
Number	685,839	5,378,835	6,064,674	92,238
Per Cent of Total	11.31%	88.69%	100.00%	
Communities Served				
Number	583	1,823	2,406	121
Per Cent of Total	24.23%	75.77%	100.00%	
Average Population per Community	1,176	2,951	2,521	762

*States included: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.
†Weighted by "Population Served."
‡According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit ____

IV-A-4-e
(I-F-1-e).

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE SOUTH ATLANTIC STATES;* JANUARY 1, 1940

(8.53 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.25	$1.38	$1.35	$2.23
100 Kwh	3.79	4.02	3.97	5.75
250 Kwh	7.39	7.15	7.21	9.94
Population Served‡				
Number	1,497,634	4,711,645	6,209,279	22,520
Per Cent of Total	24.12%	75.88%	100.00%	
Communities Served				
Number	203	1,961	2,164	37
Per Cent of Total	9.38%	90.62%	100.00%	
Average Population per Community	7,378	2,403	2,869	609

* States included: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia.

† Weighted by "Population Served."

‡ According to 1930 U. S. Census.

Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-4-f
(I-F-1-f)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE EAST SOUTH CENTRAL STATES;*
JANUARY 1, 1940
(3.16 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.95	$1.26	$1.27	$1.90
100 Kwh	4.80	3.67	3.69	5.03
250 Kwh	8.43	6.88	6.90	8.81
Population Served‡				
Number	32,837	2,265,676	2,298,513	22,897
Per Cent of Total	1.43%	98.57%	100.00%	
Communities Served				
Number	47	887	934	35
Per Cent of Total	5.03%	94.97%	100.00%	
Average Population per Community	699	2,554	2,461	654

*States included: Alabama, Kentucky, Mississippi, and Tennessee.
†Weighted by "Population Served."
‡According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit ___

IV-A-4-g
(I-F-1-g)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE WEST SOUTH CENTRAL STATES;* JANUARY 1, 1940

(7.14 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$2.30	$1.68	$1.69	$2.53
100 Kwh	5.48	4.55	4.56	6.28
250 Kwh	8.63	7.99	8.00	11.44
Population Served‡				
Number	93,867	5,101,325	5,195,192	30,245
Per Cent of Total	1.81%	98.19%	100.00%	
Communities Served				
Number	108	1,768	1,876	45
Per Cent of Total	5.76%	94.24%	100.00%	
Average Population per Community	869	2,885	2,769	672

* States included: Arkansas, Louisiana, Oklahoma, and Texas.
† Weighted by "Population Served."
‡ According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit .....

IV-A-4-h
(I-F-1-h)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE MOUNTAIN STATES;* JANUARY 1, 1940

(2.43 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Unclassified
Weighted Average Typical Bills†				
25 Kwh	$1.95	$1.56	$1.62	$2.94
100 Kwh	4.98	4.33	4.42	7.95
250 Kwh	8.98	7.98	8.11	15.65
Population Served‡				
Number	235,011	1,531,436	1,766,447	66,227
Per Cent of Total	13.30%	86.70%	100.00%	
Communities Served				
Number	142	577	719	106
Per Cent of Total	19.75%	80.25%	100.00%	
Average Population per Community	1,655	2,654	2,457	625

*States included: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.
†Weighted by "Population Served."
‡According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Exhibit _____

IV-A-4-i
(I-F-1-i)

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT AND HOLDING COMPANY SUBSIDIARY UTILITIES IN THE PACIFIC STATES;* JANUARY 1, 1940

(5.96 Per Cent of Total)

	Independent Companies	Holding Company Subsidiaries	Total	Undistributed
Weighted Average Typical Bills†				
25 Kwh	$1.33	$1.19	$1.29	$2.14
100 Kwh	3.63	3.48	3.58	5.45
250 Kwh	6.47	6.40	6.45	9.97
Population Served‡				
Number	2,945,911	1,393,700	4,339,611	26,199
Per Cent of Total	67.88%	32.12%	100.00%	
Communities Served				
Number	616	495	1,111	51
Per Cent of Total	55.45%	44.55%	100.00%	
Average Population per Community	4,782	2,816	3,906	514

* States included: California, Oregon, and Washington.
† Weighted by "Population Served."
‡ According to 1930 U. S. Census.
Source of all data: Federal Power Commission Rate Reports.

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Q. Will you please turn now to the second section in the first major group of your studies, namely, those designed to determine the relationship between the character of control over electric utilities and the economy of operation and management thereof. First, will you briefly describe this particular phase of your studies? A. This part of my work was designed to determine whether the fact that a utility is under the control of a holding company has any relationship, and, if so, what relationship, to the economy of operation and management of such utility.

Q. Will you state what tests or devices you used for measuring statistically the economy of operation and management of electric utilities, and state why you selected the same. A. In the final analysis the efficient and economic operation of electric utilities can be perfectly measured only over long periods of time. So measured, efficiency and economy of operation would be demonstrated over a period of years by continuing low rates for satisfactory service accompanied by profits to the owners of the utilities at a rate sufficient to justify devotion of their investment to electric service. While it is obviously not feasible as a practical matter thus to measure efficiency and economy for all utilities over a period of many years, and while it is probably not practical statistically to test efficiency of management in the broadest sense of its full responsibility for methods of operation, types of plant, and quality of service, I do think it is feasible to produce a statistical analysis which will serve as a measure of relative differences between groups of companies. This I have done by an analysis of the results of management and of some of its costs. In such analysis, involving electric utilities located all over the United States, I have selected those measures of economy and efficiency in management which are reasonably adapted to spot testing and which could best be subjected to statistical analysis.

Q. Please state the elements you chose and the reasons for your choice? A. I chose four such elements as being at once capable of quantitative expression and amenable to the techniques of inductive study. These elements are:

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(1) electric bills paid by consumers; (2) executive expense or salaries paid to management; (3) expenses for management and administration; and (4) fees paid for managerial service. The first of these four indexes is designed to measure the results of management and the last three of said indexes are designed to measure the costs of management. These four particular cost factors or indexes were selected by me because they appeared most likely to have a relation to differences in efficiency as between independent utility operation and holding company subsidiary operation, if any such differences existed.

Q. Will you please amplify that last statement? A. It is obvious that rates for electric service play an important part in the determination of operating efficiency; and they are the most important index because the impact of all phases of economy in management and operation come to a focus in rates. Secondly, it appears reasonable to expect that executive salaries will tend to measure the cost of managerial services. If the level of such salaries, when related to the size of operating company, tends to be higher for holding company subsidiaries than for independent utilities, it might be a point against the former on the question of their relative efficiency as compared with independent utilities. Similarly, total administrative and general expenses would seem to serve as an index of economy of management and operation of utilities. Finally, there were obvious reasons for investigating management fees since comparisons thereof as between different groups of holding company subsidiaries would afford at least some direct evidence as to management costs.

Q. Why did you not use an operating ratio, such as the ratio of total operating expense to total gross revenue, as a basis for comparing the relative efficiency of management and operation of different groups of operating utilities? A. Because in my opinion, from extensive experience in analyses of many phases of utility operation, the operating ratio is not a competent measure of managerial efficiency. It is more closely related to capital investment or capital turnover than to efficiency in management and operation.

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Q. Can you amplify that last statement a bit? A. Perhaps I can best make clear what I have in mind by an illustration. Some hydro-generating companies have operating ratios as low as 35% and some distributing companies which buy their power have operating ratios as high as 75%. Such a variation may exist largely because a hydro-generating company may have a capital investment of as high as ten times its gross revenue with resulting low operating costs while a distributing company may have a capital investment of only 3½ times its gross revenue with resulting high operating expenses because it is required to purchase the electric power which it distributes. Such a distributing company could cut its operating expenses, and consequently its operating ratio, very markedly by constructing its own generating plant although such capital investment in power plant would not contribute directly to gross revenues. We can find widespread differences in operating ratios even within the same holding company system although all the operating subsidiaries thereof are presumably equally well managed. Plainly, it is impossible to assume that efficiency of management and operation can be directly related to the operating ratio, unless a number of other operating characteristics not susceptible of statistical expression are taken into account.

Q. Why did you not use ratios of various operating expenses per customer as bases for comparing the relative efficiency of management and operation of different groups of utilities? A. I did not use any such ratios because the available accounting data do not lend themselves to separation of the various items of operating expense as between different types of electric service. Thus, there are no figures to show what are the costs of furnishing residential electric service as distinct from the costs of furnishing commercial or industrial electric service.

Q. In the first section of this first major group of studies, which deals with the relationship of holding company control to cost of electric service to consumers, you employed weighted average electric bills as a criterion or index for measuring such cost. Now, as I understand it, you propose

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to employ electric bills as one of the tests of efficiency of management and operation. In using electric bills for this latter purpose, are you going to employ the same weighted average bills which you used as your index of the cost of electric service to consumers? A. No. The weighted average bills which I used for measuring the cost of electric service to consumers were derived from electric bill data as to 18,000 communities without any consideration of the performance of individual companies serving said communities. This was the best way of measuring the impact of the cost of electricity upon consumers. Now, in this present section of my studies in which I am undertaking to compare relative efficiency of management and operation of different groups of utility companies, I am employing electric bills as a measure of the relative efficiency in furnishing or providing electric service, but on a somewhat different basis. Electric bills are here used as an external measure of efficiency of operation. Therefore, for this latter purpose, I am using simple arithmetic averages of the weighted average electric bills charged by each company in the several groups of companies whose relative efficiency of management and operation is to be compared.

Q. Can you justify from a statistical standpoint the validity or reasonableness of using these averages of averages you have just described? A. Yes. Statistical techniques involving the use of averages of averages are quite legitimate if logically used. The procedure which I have just described is reasonable and logical, first, because the weighted average bills charged by each electric utility comprise a reasonable expression, characterization, or index of what each company actually charges for 25, 100 and 250 KWH of electricity. It is evident that what a particular company charges customer A, or B, or C for a given number of KWH of electricity would not be a correct index of what that company actually charges to its customers as a whole, because A and B and C might live in different communities having different rate schedules. Likewise, what a particular company charges all of its customers located in community X for a given number of KWH of electricity would

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not necessarily be a correct index of said company's actual charges to its customers as a whole, because such charge might differ from its charges in communities Y and Z in which the populations may be greater or less than the population in community X. In order fully to reflect the fact that electric utilities serve different numbers of customers at different rates, it is necessary to deal in terms which include both of those variables. Accordingly, I adopted weighted average bills of individual companies as the most satisfactory index of company performance.

The reasonableness of the weighted average bill as an index of individual company performance being clear, the best way to reflect the performance of a group of companies is by the use of simple averages of individual company averages. The simple arithmetic average is generally accepted as the best medium for expressing the usual or ordinary expectation within any class of data made up of properly comparable items. It follows, then, that within the various classes or groups of electric utilities here involved, and looking upon the companies as individual units, the arithmetic averages can be looked upon as a reasonable expression of the common run performance. Comparisons of these averages of averages for the various groups of utilities here involved, are, in my opinion, the most reasonable and satisfactory means that could be selected for establishing and measuring differences in the electric bills charged by the companies in such groups.

Q. Turning now to the three elements having to do with management costs which you mentioned, will you describe the source of the data which you used and the procedure which you followed in connection therewith? A. Although all of the elements of the cost of utility management cannot be reduced to the necessary common denominator for purposes of comparison as between various groups of utilities, there are those representative items of expense closely associated with the management functions which can be compared. Thus, the "Uniform System of Accounts Prescribed for Public Utilities" promulgated by the Federal Power Commission, and made the basis for

reports by electric companies to that body on Federal Power Commission Forms Nos. 1, 96 and 97, embody a group of charges known as "Total Administrative and General Expenses." As may be seen from the descriptions of Accounts Nos. 790 to 809 in the Federal Power Commission Uniform System of Accounts, the totals of this group of charges to which I have referred include by definition those expenses which are incurred in the payment of all salaries, fees, and expenses directly associated with the performance of the management function. Since it may fairly be presumed that companies reporting to the Federal Power Commission do so reasonably in accordance with the prescribed system of accounts, I believe that the cost of at least one significant phase of management may be measured by the group of charges known as "Total Administrative and General Expenses."

Q. What is the source of your data with respect to the element in the cost of management which you refer to as "executive expense" or "salaries paid to management"? A. By definition, Federal Power Commission Account No. 790, which is a sub-account under "Total Administrative and General Expenses," entitled "Salaries of Officers and Executives," comprises that portion of the salaries of officers and executives attributable to management. In my opinion, charges to said Account No. 790 represent a reasonably satisfactory measure of the cost of general executive services unaffected in so far as possible by the costs of performing purely operative functions. I have therefore used charges to Account No. 790 as a measure of executive expense and thus as a measure of the cost of the personal service element in general management at the level of compensation where going rates of wages are least apt to guide and limit expenditures for such service. I believe that comparisons of that portion of the Federal Power Commission Account, "Total Administrative and General Expenses," represented by Federal Power Commission Account No. 790, "Salaries of Officers and Executives," will be helpful in the interpretation of any significant differences in the relative costs of management as

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between selected groups of electric utilities as indicated by comparison of charges to the account "Total Administrative and General Expense."

Q. Why did you select fees paid to mutual service companies for managerial service as one of the criteria of economy of operation and management, and what was the source of your data in this connection? A. Although this criterion does not apply to all electric utilities, it seemed to me that since a large number of holding company subsidiaries do employ mutual service affiliates in their management, an analysis of management fees and expenses paid to such affiliates would be helpful in a determination of economy of management and operation of holding company subsidiaries which do employ such service affiliates, and accordingly I have made an analysis of such fees. I secured the requisite data from company annual reports to the F.P.C. on Forms #1, #96 and #97.

Q. On what basis did you undertake to compare the three elements relating to cost of management as between independent utilities and holding company subsidiaries? A. Since it is obviously impossible to compare directly the dollars of expenditure of differing groups of utilities for any of the three management expense items as a basis for determining relative costs of management, it was necessary that said expense items be reduced to a common denominator. Therefore, for the purposes of my study and in order to effect the necessary degree of comparability, all three management cost indexes are expressed in terms of "Dollars per $1,000 of Electric Revenue." In order to provide a check on the accuracy of the results and prevent the possibility of the development of any freak situations, the "Total Administrative and General Expenses" and "Management Fees and Expenses" were also computed in terms of "Percent of Total Electric Operating Expenses." The data showing Total Electric Operating Expenses I also secured from Federal Power Commission Form No. 1. Since the "Total Administrative and General Expense" figure is the all inclusive expense figure, so far as this phase of my studies is concerned, the procedure I have followed facili-

tates the spotting of any cases where arbitrary misallocation of significant amounts of management costs to other accounts would unjustifiably reduce the cost of management index.

Q. Have you completed the description of the statistical techniques used in the computation of these management indexes? A. Yes, so far as presently necessary.

Q. Having discussed the various indexes by which the relative economy of operation and management of utilities may be measured, I now direct your attention to the specific comparisons which you have made in order to determine whether the fact that an operating utility is controlled by a holding company has any relationship, and if so, what relationship, to the economy of operation and management of such utility. First, have you caused to be prepared a table (IV-B-1) entitled "Management Indexes for Electric Utilities; Classified by Type of Control; 1939"? A. Yes.

(Have Exhibit IV-B-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-B-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth therein to be accurate? A. I do.

Q. Will you please describe Exhibit ..... for Identification (IV-B-1)? A. Said Exhibit shows the average bills for 25, 100, and 250 KWH of electricity, respectively, of the same two groups of electric utilities, namely (1) 182 independent utilities, and (2) 454 holding company subsidiaries. I have already described the manner in which the said average bills were computed. Said Exhibit also shows, in respect of each of these two groups of utilities, the average executive expense per $1,000 of revenue, the average administrative and general expense per $1,000 of revenue, and the ratio between such average administrative and general expense and total expense. Said Exhibit also shows, not as part of the main purpose of the Exhibit, but as matter of related interest, the average management fees per $1,000 of revenue of such of those subsidiaries of hold-

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ing companies which operate under mutual service agreements. Perhaps I should add that data as to average electric bills were available in respect of all the 636 operating utilities which comprise the basic sample for all my studies. Data as to average executive expense, average administrative and general expense, and average management fees were available on a comparable basis only with respect to 419, 337 and 246 operating utilities, respectively, as is indicated in the Exhibit. The exhibit also shows in each case the extent of the sample represented by each group as measured by sales of electricity to ultimate consumers.

(Here offer Exhibit ..... for Identification (IV-B-1) in evidence.)

Q. What does Exhibit ..... (IV-B-1) indicate with respect to the relative economy of management and operation of the two groups of utilities dealt with therein as reflected by their respective charges to consumers for electric service? A. The average electric bills for 25, 100 and 250 KWH of electricity, respectively, of the independent utilities are markedly higher than those of the holding company subsidiaries. To illustrate, the average bills of the independent utilities for 25, 100 and 250 KWH of electricity, respectively, are $1.96, $5.05, $8.82 as compared with the figures of $1.77, $4.67, $8.32 for the holding company subsidiaries. Other things being equal, these differences would clearly indicate greater economy in service and operation on the part of utilities which are subsidiaries of holding companies.

Q. What do you mean by the phrase "other things being equal"? A. I mean that, if we assume that all utilities, independents and subsidiaries alike, earn about the same rate of return on their investment, render the same types of service, and operate under the same conditions generally, then lower bills would clearly indicate greater efficiency in management and operation.

Q. Do you believe that independents and subsidiaries by and large operate under substantially the same or equal conditions? A. I have made no study of individual com-

panies for the purpose of making such a determination but when one considers that the statistical sample contains 182 independents and 454 subsidiaries, there are undoubtedly all kinds of conditions represented in each group. Since both groups cover units scattered throughout the entire nation, it seems reasonable to assume, in view of the very substantial number of units in each group, that the averages for these groups are really indicative and comparable statistically.

Q. Do you regard the sample upon which you base your conclusions as adequate? A. Yes. The 182 companies in the group of independent utilities and the 454 companies in the group of holding company subsidiaries together represent 100% of the 636 companies which are the sample used throughout my studies. This sample, as I have before stated, represents nearly 96%, in volume of sales, of the private electric utility business of the nation. Not only, in my opinion, is the total sample adequate but there is a sufficient number of companies in each group to assure the reasonableness of the average figures.

Q. Will you now state what Exhibit ..... (IV-B-1) indicates with respect to the relative economy of management of the two groups of utilities classified thereon as measured by the average executive expense per $1,000 of revenue? A. Said Exhibit shows that the average executive expense per $1,000 of revenue of the holding company subsidiaries is substantially less than that of the independent utilities, the figure being $13.93 for the latter and $39.60 for the former. Since the amounts charged by electric utilities for executive expense are in my opinion representative of the relative amounts spent in the performance of the general management function, I believe that the comparison I have just stated indicates that holding company subsidiaries tend to spend less than independent utilities in providing general executive service.

Q. In your opinion are the differences in the figures you last stated great enough to preclude any possibility of explanation in terms of differences in accounting practices as between independent utilities and holding company sub-

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sidiaries? A. Yes. I might add that the considerably lower figure for average executive expense in the case of the holding company subsidiaries is a reasonable expectation if there exist any dollar economies in holding company management.

I might also add, although this fact does not appear on the face of the Exhibit, that I broke down the figures covering average executive expense per $1,000 of revenue for the 318 companies comprising the holding company subsidiary group making up this particular sample of my study into holding company subsidiaries which use mutual service companies and holding company subsidiaries which do not operate under mutual service agreements. I found that the average executive expense was lower for holding company subsidiaries using mutual service companies than for holding company subsidiaries not using mutual service companies. This, too, is reasonably to be expected in light of the possibilities, under a mutual service arrangement, of spreading executive costs over a number of companies.

Q. In your opinion, does your study of the relative average executive expense of the two groups of utilities here in question cover enough companies to give statistical validity to your conclusions? A. Yes. While data for this particular study were available only with respect to 419 of the 636 companies comprising my total sample, the companies covered represent 99% of the total sample on the basis of sales of electricity.

Q. Will you now state what Exhibit ..... (IV-B-1) indicates with respect to average administrative and general expenses per $1,000 of revenue as between the two groups of utilities in question? A. First, may I say that on said Exhibit the administrative and general expense items are expressed not only in dollars per $1,000 of revenue but also as percentages of total operating expenses. The first of these two bases of comparison indicates, of course, that portion of each revenue dollar which goes to general and administrative expense. By relating this ratio of administrative and general expenses to total operating expenses, a more careful observation can be made of any variations in economy

of management, as between different groups of utilities, as measured by this particular index.

Exhibit ..... (IV-B-1) shows that the average administrative and general expense per $1,000 of revenue of independent utilities is higher than that of holding company subsidiaries, the figure being $85.83 as compared with the figure of $72.80 in the case of holding company subsidiaries. The Exhibit also shows that the average administrative and general expense of independent utilities constitutes 20.24% of their total operating expenses whereas the average administrative and general expense of holding company subsidiaries constitutes only 16.02% of their total operating expenses. While the differences between the average administrative and general expenses of independent utilities and of holding company subsidiaries are not so great as in the case of executive expense alone, they are uniformly in the same direction and afford further evidence that the average cost of management of the independent utilities is greater than that of the holding company subsidiaries.

Q. Do you regard the sample upon which the last-mentioned comparison is based as adequate? A. Yes. While only 337 companies out of the total sample of 636 companies are covered by this phase of my study, the companies omitted are for the most part small ones whose reports are not available in sufficient detail. Based on sales of electricity, 98% of the total sample is included. This is clearly adequate.

Q. Have you made any further tests in an effort to confirm the validity of the statistical conclusions indicated by Exhibit ..... (IV-B-1)? A. Yes. As a part of my second major group of studies dealing with the relationship between size of operating company and the objectives of the Act, which group of studies I shall later discuss in detail, I made a study of the average typical electric bills for 25, 100 and 250 KWH of electricity as between independent utilities and holding company subsidiaries of various sizes. That is to say, these average bills were broken down for each group of utilities according to eight company size classifications, said size classifications being based upon

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total electric revenues. These studies constitute a significant statistical sub-sampling of the data just presented relating to the effect of holding company control upon economy of management and operation. This sub-sampling shows that the average typical bills of holding company subsidiaries, at all three use levels and in all company size classifications are quite consistently lower than those of independent utilities.

Q. Have you prepared a table to illustrate the statement which you have just made? A. Yes. Merely as an illustration I have prepared a table showing the average typical bills for 25 KWH of electricity of independent utilities and holding company subsidiaries in each of the eight company size classifications.

(Have Exhibit IV-B-2 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-B-2) prepared by you or under your supervision? A. Yes.

Q. Do you believe it to be accurate? A. I do.

(Here offer Exhibit ..... (IV-B-2) for Identification in evidence.)

Q. What is the significance of Exhibit ..... (IV-B-2) with respect to the statistical conclusions indicated by Exhibit ..... (IV-B-1)? A. The fact that in every company size classification the average electric bills of holding company subsidiaries for 25 KWH of electricity are consistently lower than the average bills of independent utilities lends convincing statistical support to the conclusion which I have already stated, based on Exhibit ..... (IV-B-1), to the effect that economy of management and operation of utilities is not adversely affected by holding company control.

Q. Looking at Exhibit ..... (IV-B-1) as a whole, what are your general conclusions with respect to whether or not the fact that an electric utility is controlled by a holding company has any relationship to the economy of operation

and management of such utility? A. Whether one considers the external relations of electric utilities with their customers as expressed in average typical bills or whether one considers the economy of electric utility management in terms of specified indexes of managerial costs, there is no evidence that electric utilities which are controlled by holding companies are operated or managed less economically than independent electric utilities. As a matter of fact, the studies heretofore described indicate that independent electric utilities on the average bill their customers at higher rates for electricity and in proportion charge more dollars to their management accounts than do electric utilities which are subsidiaries of holding companies.

Q. On the basis of all your studies, what is your conclusion as to the relative efficiency in management and operation of independent utilities and holding company subsidiaries? A. It is not universally possible to attribute causal relations to all statistically different averages such as appear between the several indexes of operating efficiency employed in my studies. Nor would I like to suggest that the dollar differences in the various averages measure the actual degrees of difference in economy of management and operation. However, I am willing to say emphatically that, in my opinion, the data presented are sufficiently consistent, the sample sufficiently representative, and the tests sufficiently indicative, to justify my general conclusion that independent utilities as a class are not operated and managed any more economically than holding company subsidiaries; in fact, the available evidence is to the contrary.

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Exhibit .....

V-B-1
II-A-1)

MANAGEMENT INDEXES FOR ELECTRIC UTILITIES; CLASSIFIED BY TYPE OF CONTROL; 1939

	Independent Companies	Holding Company Subsidiaries	Total	Per Cent of Sample by Sales
Average Typical Bills				
No. of Companies.....	182	454	636	
25 Kwh	$1.96	$1.77	$1.82	100
100 Kwh	5.05	4.67	4.78	100
250 Kwh	8.82	8.32	8.46	100
Average Executive Expense per $1,000 Revenue				
No. of Companies.....	101	318	419	
Average	$39.60	$13.93	$20.12	99
Av. Adm. & Gen'l Expense per $1,000 Revenue				
No. of Companies.....	65	272	337	
Average	$85.83	$72.80	$75.31	98
Av. Adm. & Gen'l Expense as Per Cent of Total Expense				
No. of Companies.....	64	269	333	
Average	20.24%	16.02%	16.71%	98
Av. Mgt. Fees per $1,000 Revenue*				
No. of Companies.....		246	246	
Average		$14.89	$14.89	98
Av. Mgt. Fees as Per Cent of Total Expense*				
No. of Companies.....		193	193	
Average		2.95%	2.95%	89

*Includes only those companies operating under mutual service agreements.

Sources of Data:

F. P. C. Rate Reports

F. P. C. Form #1 Annual Reports filed by utility companies

F. P. C. Forms #96, 97 Annual Reports filed by small utility companies

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Exhibit ___

IV-B-2
(II-A-pg. 2)

AVERAGE TYPICAL ELECTRIC BILLS FOR 25 KWH FOR INDEPENDENTS AND HOLDING COMPANY SUBSIDIARIES CLASSIFIED BY SIZE OF COMPANY 1939

Size Groups—Total Electric Revenues of Operating Companies	Independents	H. C. Subs.
Under $250,000	$2.09	$2.05
$250,001 to $500,000	2.01	1.93
$500,001 to $1,000,000	1.81	1.78
$1,000,001 to $3,000,000	1.95	1.74
$3,000,001 to $5,000,000	1.71	1.63
$5,000,001 to $10,000,000	1.83	1.59
$10,000,001 to $20,000,000	1.69	1.40
Over $20,000,000	1.45	1.35

Source: Federal Power Commission Reports
Moody's Manual of Public Utilities, 1940.

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Q. Will you now turn to the third section of your first major group of studies, namely, that designed to show the relationship between the character of control over utilities and the soundness of their financial policies and practices, and describe the same? A. This part of my first major group of studies seeks to determine whether the fact that an operating utility is controlled by a holding company has any relationship and, if so, what relationship to the soundness of its financial management.

Q. In your opinion, is it practicable to test statistically the relative efficiency of the financial management of different groups of utilities? A. Within limits, yes. While it is impossible, because of individual characteristics peculiar to particular companies, statistically to compare various groups of companies from the point of view of their relative efficiency of financial management in its complete and broadest aspects, nevertheless, there are certain factors susceptible of statistical comparison which at least provide significant clues as to the relative efficiency of financial management.

Q. Please state the factors which in your opinion provide bases for comparison of the relative efficiency of financial management. A. There are several such factors or tendencies which are susceptible of statistical treatment. One of these is the cost of capital; that is, the rates of bond interest and preferred stock dividends. With respect to this factor, I think it is possible by a survey of the utility field as a whole to determine whether the costs of capital are significantly different for independent utilities and holding company subsidiaries.

Another somewhat related factor is the cost of *raising* capital, that is, the cost of obtaining bond money and preferred stock money. Such costs may be measured in terms of bankers' fees and expenses incidental to the issuance and distribution of bonds and preferred stocks.

Still another factor or tendency of more general application which is susceptible of statistical treatment is what I shall describe as "income administration," or the use of income or earnings after they have been received. The

income of a company may be thought of as composed of two parts: one part, the disposition of which has been determined by previous contracts, and the other, that part remaining to be distributed at the discretion of the board of directors. Soundness of financial management may be displayed with respect to either or both of these segments. The degree to which present income is encumbered with prior contractual claims serves as a criterion of financial decisions of the past, while the degree to which the residual is distributed characterizes present financial policies.

In addition to the foregoing factors, it seemed to me that a study of the relative availability of equity capital as between independent utilities and holding company subsidiaries might shed some light on the relative soundness of financial management, and accordingly I made such a study.

Upon an overall consideration of the indexes which I have described I believe that it is possible to compare in a reasonably satisfactory manner the soundness of financial management policies as between independent utilities and holding company subsidiaries.

Q. Directing your attention to the first of the several factors which you have mentioned, namely, the cost of capital, please describe the procedure by which you have undertaken to make a comparison of such cost as between independent utilities and holding company subsidiaries? A. I made a study of the cost of bond money and the cost of preferred stock money as reflected in the sales of bonds and preferred stocks by independent utilities and by holding company subsidiaries during the years 1938 and 1939. My computations were restricted to mortgage bonds and preferred stock of operating utilities offered during the last two years, namely, 1938 and 1939, for which the data were available at the time my studies were being made. Similar data were available for the years 1935, 1936, and 1937, but market conditions during those years were decidedly different than during 1938 and 1939, and it seemed unwise to attempt comparisons of the character in question as between periods which were unlike from the point of view of security market conditions. Accordingly, I con-

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fined my data to 1938 and 1939. Although there were the usual fluctuations in the securities markets during 1938 and 1939, the utility bond and preferred stock markets remained relatively stable during those two years and, moreover, the data for those two years appeared to offer a broad enough field for my purposes.

I might point out that for one phase of my study certain utility bonds and preferred stocks sold in 1940 were included.

Q. Why did you not base your study on the current market prices of bonds and preferred stocks of operating utilities instead of on offering prices? A. Current market prices might have provided a satisfactory basis of comparison except for the fact that during recent years so many operating utility bonds and preferred stocks have not sold and do not now actually sell on a yield basis which is expressive of the true cost of capital to the respective issuers. In the security markets which were current in the latter part of 1939 it was difficult indeed to find a high grade utility bond whose market price was not influenced by its call price. Therefore it was quite impossible to compile a list of representative bond issues of independent utilities and holding company subsidiaries whose prices would not have been influenced by this element of call price. Since, however, the call prices for new issues are commonly set to avoid undue influence on offering prices, I did deem it possible, by observation of the offering prices of a sufficient number of new issues of utility bonds and preferred stocks, to secure the market's interpretation of the cost of money for operating utilities.

Q. What were the sources of the data which you used in compiling the data with respect to sales of bonds and preferred stocks by operating utilities during 1938, 1939 and 1940? A. With respect to the years 1938 and 1939, I used a report of the Public Utilities Division of the Securities and Exchange Commission, dated January 23, 1940, to provide the list of issues and yields and costs thereof. This report includes all public issues of both independent utilities and holding company subsidiaries, and all private issues of holding company subsidiaries, sold during the

years 1935 through 1939. With respect to 1940, I used the current releases of the S.E.C. covering each individual issue of securities.

Q. How did you use the data which you have just described for the purpose of comparing the costs of bond and preferred stock money as between independent utilities and holding company subsidiaries? A. From the report of the Public Utilities Division of the Securities and Exchange Commission just referred to, I took the figures for "net cost to issuer" and "yield to investor." I figured both weighted and unweighted average costs and yields from these, using the par amount of bond issues and the offering price of preferred stock issues as the weighting factors for bonds and preferred stocks, respectively. Further, from the same report, I derived a measure of the cost of raising capital; this being the arithmetic difference between "net cost to issuer" and "yield to investor." The average of this per annum cost differential expressed the fees and expenses of issuing bonds and preferred stocks on a per annum basis, which made these elements comparable as between the groups of companies in spite of differences in maturity dates of the securities.

Costs of bond money expressed in such per annum terms can reasonably be expected to reflect the interest rate, the investment risk attached to the investment as affected by an issuer's business and his financial structure, and the issuer's ability to reach the capital market. Accordingly, any comparison of such costs, as between different groups of issuers of bonds, which brings to light significant differences should be reasonable reflections of differences in economy of financial management.

Q. As part of the particular study now being discussed, have you caused to be prepared a table entitled, "Yields and Costs on Mortgage Bonds Sold by Electric and Gas-Electric Utilities; 1938 and 1939"? A. Yes.

(Have Exhibit IV-C-1 marked Exhibit ..... for Identification.)

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Q. Was Exhibit ..... for Identification (IV-C-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Does it show on its face the source of the data set forth thereon? A. It does.

Q. Will you describe Exhibit ..... for Identification (IV-C-1)? A. Said Exhibit shows in respect of the years 1938 and 1939 separately, and for both of said years together, the number of issues and aggregate par value of all mortgage bonds issued and sold, at public sales, by (1) all independent electric and gas-electric utilities, and (2) by all electric and gas-electric utilities which are subsidiaries of holding companies. Also included in the table are all holding company subsidiary bond issues *privately* sold and those independent utility bond issues *privately* sold during said two years for which the S.E.C. has a record on the basis of registration under the Securities Act of 1933. The Exhibit shows, for the two years mentioned and in respect of each of the two groups of utilities mentioned, the average net cost and the average yield of all mortgage bonds sold. Said average net cost and average yield figures are shown both on a simple or unweighted basis and on a weighted basis, the weighting being according to the par value of the mortgage bonds sold by each group of utilities. Exhibit ..... for Identification (IV-C-1) also shows, for the two years in question and in respect of each of the two groups of utilities in question, the average fees and expenses of issue, on a per annum basis, for the mortgage bonds sold, this latter figure being computed from the difference between net cost based on net proceeds to the issuer after all fees and expenses, and yield to the investor based on the offering price.

(Here offer Exhibit ..... for Identification (IV-C-1) in evidence.)

Q. What does Exhibit ..... (IV-C-1) show with respect to the relative costs of bond money as between independent

utilities and holding company subsidiaries? A. It indicates, in my opinion, that on the basis of funds borrowed during 1938 and 1939 there were no substantial differences in the net cost of mortgage bond money as between independent utilities, on the one hand, and holding company subsidiaries, on the other hand.

Q. Will you state the basis for that conclusion? A. In order to achieve reasonable comparability, Exhibit ..... (IV-C-1), showing costs and yields on utility bonds sold during 1938 and 1939, was compiled exclusively on the basis of mortgage bonds. Therefore it reflects only the costs of mortgage bond money and takes no account of notes or debentures, but for purposes of testing the relative level of capital costs the data should be adequate.

It will be noted from Exhibit ..... (IV-C-1) that during the years 1938 and 1939, taken separately, there are considerable differences at all the points at which comparisons have been made. In 1938 the holding company subsidiaries appear at a disadvantage as compared with the independent utilities, whereas in 1939 the reverse is true. These differences are undoubtedly due to the fact that the sample available on a single year basis is in each instance hardly large enough to permit a reasonable statistical result. However, the mortgage bond offerings for the two years 1938 and 1939, taken together, include a sufficient number of offerings upon which to predicate a reasonably satisfactory statistical comparison, and all are within a period of time encompassed by reasonable limits. For the two-year period, the average net cost of mortgage bond money raised by holding company subsidiaries was .09% per annum higher than for independent utilities when the averages of net cost are weighted by the par amounts of the issues of each group of companies; but when the average net costs of the two groups are considered on an unweighted basis, that of the holding company subsidiaries averages .08% per annum lower than that of the independent utilities. These differences, in either direction, are wholly inconclusive with regard to relative costs of bond money as measured in terms of the cost thereof. This is particularly so when it is con-

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sidered that any of the items in the series of comparisons set forth on Exhibit ..... (IV-C-1) can be influenced by the mere size of individual issues of bonds and by their investment quality, and that even the billion dollar total of issues does not certainly include companies representing an accurate cross section of the entire utility industry or of independent utility or holding company subsidiary groups within the industry. However, with due regard for these limitations, it seems clear that there were no essential differences in the net costs of mortgage bond money raised by independent utilities and holding company subsidiary utilities during the years 1938 and 1939.

Q. What is the significance, if any, with respect to the conclusion you have just stated of the data set forth on Exhibit ..... (IV-C-1) relating to the average yield and the average per annum cost differential of the bonds issued by the two groups of utilities in question? A. Such data support said conclusion. Exhibit ..... (IV-C-1) shows that on the average, during the years in question, the yields available to investors on the new bond issues of both groups of utilities were strikingly similar. Moreover, it appears that bankers spreads and other expenses in connection with the bond issues of both groups of utilities, when expressed on a yield basis to effect per annum comparability, are precisely the same on a weighted average basis.

Q. Now, in order further to support your conclusions with respect to the present section of your studies, have you prepared a chart entitled, "Relationship between Independent and Subsidiary Company Bond Issues in Terms of Costs and Interest Coverage (1938-1940)"? A. Yes.

(Have Chart IV-C-2 marked Exhibit ..... for Identification.)

Q. Was this chart prepared by you or under your supervision? A. Yes.

Q. Do you believe it to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-C-2). A. That is a graph or chart on which are plotted 47 bond issues of holding company subsidiaries and 18 bond

issues of independent utilities, in such a manner as to indicate, as to each bond issue, the yield per annum and the interest coverage or times interest earned. In this instance the yield basis has been figured from gross proceeds to the issuers before expenses other than bankers' fees. The 65 bond issues reflected on the Exhibit are those of utilities which were sold during the period from January 1, 1938, to October 16, 1940, and include all operating company bond issues, secured and unsecured, of $5,000,000 or more with 25 to 30 year maturities. Said size and maturity limits were imposed to achieve comparability and to avoid the effects of short term money rates on yield. The interest coverage was figured to the nearest available date of issue with corrections made *pro forma* to include the issues involved. A double log scale was used for plotting the 65 bond issues in recognition of the decreasing influence of increasing interest coverage and to spread the data for better analysis in the lower cost ranges.

Q. Just a minute, Dr. Waterman. What do you mean by the phrase "double log scale" which you just used in connection with this chart? A. By that phrase I refer to the fact that, in this chart, both the horizontal scale, along the base of the chart, and the vertical scale, along its left side, are drawn on a ratio or logarithmic basis.

Q. Will you explain more fully the significance of such a ratio or logarithmic scale and state why it was used on this chart? A. I believe that I have already explained that it is sometimes desirable to use a logarithmic scale when an attempt is made to portray relative differences in a visual or graphic manner. If a further explanation is needed, perhaps it can be done most effectively by contrasting a logarithmic scale with a natural scale. The latter type is one which measures each unit by a span of equal dimensions; i. e., each hundred dollars, or foot, or ton, or whatever unit of variable might be under observation, would be measured on the chart by, let us say, one inch on the scale. Now, using a logarithmic scale, each unit would be measured by progressively smaller spans as the number of units increases. For instance, on the chart in

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question where the horizontal scale along the base measures the number of times bond interest has been earned, you will notice that the difference between 2 times interest earned and 3 times interest earned is measured by 3 inches and that the difference between 3 times interest earned and 4.5 times interest earned is likewise measured by 3 inches, and that this relationship continues throughout. A logarithmic or ratio scale is thus one which measures differences relative to each other, or, to put it another way, it is a scale which always considers percentage differences, rather than actual differences, as the unit of measurement. Thus, the difference between 2 times interest earned and 3 times interest earned is, of course, 50%, and the ratio is measured by 3 inches on the scale; the difference between 3 times interest earned and 4.5 times interest earned—although greater *actually* than the difference between 2 times interest earned and 3 times interest earned—is likewise 50%, and hence is also measured by 3 inches on the scale and so on. Similarly, on the vertical scale of Exhibit ..... for Identification (IV-C-2), which measures cost of bond and preferred stock money, the difference between 2.5% and 3% money cost is 20% or 1-5/16 inches on the scale, and the difference between 3.5% and 4.2% money cost is likewise 20% and is likewise measured by 1-5/16 inches on the scale, because it expresses percentage differences.

Q. I think that is satisfactory, Dr. Waterman. Now, will you please explain the significance of the lines running diagonally across the chart? A. In statistical parlance these lines would be referred to as "regression lines," but, more simply, they represent the average relationships between the factor of "times interest earned" and the factor of "cost of money" for the bond issues of holding company subsidiaries and independent utilities. The position of the lines is related to, and mathematically fixed by, the position on the chart of the dots and crosses. Each of the dots indicates a financing operation by a holding company subsidiary and each of the crosses indicates a financing operation by an independent company. The regression line, or axis around which the dots center, is the dotted line, and the re-

gression line, or the axis around which the crosses center, is the solid line.

The positions of these lines on the chart were determined by a standard statistical method known technically as "fitting by method of least squares" which I would be glad to explain in detail if desired. It is perhaps more simple to point out that it is quite easy to see from the chart itself that each of the two regression lines runs approximately through the center of the scattered dots and crosses in the field. In fact, each line is a progressive average of its respective items. Each has all the properties of an average and represents the changes in the position of each average as it passes along the horizontal axis of the chart. The actual difference in the position of the two lines is the result of mathematical fitting which places the dotted line representing the relationship between independent utilities bond issues and bond interest coverage slightly above the solid line representing the relationship between holding company subsidiary bond issues and interest coverage.

Q. Did you prepare a table setting forth the data from which Exhibit ..... for Identification (IV-C-2) was prepared? A. Yes.

(Have Exhibit IV-C-3 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-C-3) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Will you briefly describe Exhibit ..... for Identification (IV-C-3)? A. Said Exhibit sets forth a description of each of the 65 bond issues which are plotted on the chart which is Exhibit ..... for Identification (IV-C-2). It shows, in respect of each of said 65 bond issues, the name of the issuing utility, the interest rate, maturity, par amount of the issue, price to the investor, gross proceeds to the issuer, cost to the issuer, and the *pro forma* interest coverage or times interest earned.

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(Here offer Exhibits ..... (IV-C-2) and ..... (IV-C-3) for Identification in evidence.)

Q. What do Exhibits ..... (IV-C-2) and ..... (IV-C-3) indicate with respect to the relative costs of bond money as between independent utilities on the one hand and holding company subsidiaries on the other hand? A. Said Exhibits show that, during the period of time under examination, utilities sold bonds at a variety of per annum costs at each quality of investment level as measured by interest coverage. As appears from the two regression lines on the chart which is Exhibit ..... (IV-C-2), the high and the low cost issues are about evenly divided, proportionately, between issues of independent utilities and issues of holding company subsidiaries; both have their high and low cost issues.

It will be noted that there is a very slight difference between the two regression lines on the chart, which fact might at first blush seem to indicate that independent utilities tended to pay very slightly less for bond money in all quality of investment ranges than did holding company subsidiaries. The slight variation between the two regression lines must, however, be considered in light not only of the nominal degree of difference, but also of truth of the statistical implication. In fact, the degree of difference is so nominal as to lack statistical significance.

I conclude that there is no evidence that costs of bond money are higher in the case of holding company subsidiaries than in the case of independent utilities; in fact such statistical evidence as there is indicates there is really no significant difference in respective costs.

Q. Now, as part of your study of the cost of capital, have you caused to be prepared a table entitled "Yields and Costs of Preferred Stocks Sold by Electric and Gas-Electric Utilities; 1938 and 1939"? A. Yes.

(Have Exhibit IV-C-4 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-C-4) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Does said Exhibit show on its face the source of the data set forth thereon? A. Yes.

Q. Will you describe Exhibit ..... for Identification (IV-C-4)? A. It sets forth data of precisely the same general character as that set forth on Exhibit ..... (IV-C-1) except that Exhibit ..... for Identification (IV-C-4) involves preferred stocks instead of mortgage bonds.

(Here offer Exhibit ..... for Identification (IV-C-4) in evidence.)

Q. What conclusions, if any, do you deduce from Exhibit ..... (IV-C-4) with respect to the relative costs of preferred stock capital as between the two groups of utilities here involved? A. During the years 1938 and 1939 there were only 16 offerings of preferred stock by electric and gas-electric utilities. This is so small a number of offerings that statistical analysis thereof probably has little significance. For what it may be worth, Exhibit ..... (IV-C-4) has been prepared to show the relative performance of independent utilities and holding company subsidiaries which did offer preferred stock for sale during 1938 and 1939. The study shows that, as in the case of utility bond issues, there are differences within each year which can be given no cognizance because of the inadequate size of the sample in each instance. However, it may be noted that net costs to issuers on a weighted average basis did run consistently lower for holding company subsidiaries than in the case of independent utilities. Similarly, the weighted average yields were lower for the holding company group. When expressed on a per annum basis, the costs of raising preferred stock capital show no significant differences as between the two groups of utilities in question; the .01% differential having absolutely no significance in view of the meagerness of the sample.

Q. Viewing all your studies as to the costs of bond and preferred stock money, what are your conclusions as to the

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relative costs of capital as between independent utilities and holding company subsidiaries? A. On the basis of the data available from securities sales in the three years, there is no evidence that holding company subsidiaries are subject to higher costs of bond and preferred stock money than independent utilities. It is likewise true that the cost of raising capital; that is, the bankers' fees and incidental expenses, shows no relative superiority on the part of either group of utilities. While the evidence on which these conclusions are based, particularly that relating to preferred stock issues, is not entirely satisfactory, there certainly is no basis for the belief that in recent years independent utilities have enjoyed any advantage over holding company subsidiaries either in the matter of money costs or the costs of raising capital.

Q. Now, Dr. Waterman, will you turn to that part of your study which is designed to determine relative economy of financial management as between independent utilities and holding company subsidiaries as measured by what you call "income administration"? Have you caused to be prepared a table entitled, "Income Administration Ratios of Independent and Subsidiary Utilities; Classified According to Type of Control, 1939"? A. Yes.

(Have Exhibit IV-C-5 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-C-5) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Will you explain this concept of "income administration" which you mention and show what bearing it has on the matter of economy of financial management of utilities? A. A few moments ago I discussed costs of bond money and costs of preferred stock money as indexes measuring one angle of economy of financial management, and I consider the ratios used in Exhibit ..... for Identification (IV-C-5) simply as additional indexes bearing on the same matter.

As I have indicated previously, the income of a corporation may be thought of as composed of two parts; one part, the disposition of which is determined by contracts with senior security holders and the other that part remaining to be distributed at the discretion of the Board of Directors. Relative soundness of financial management may be displayed in either part of this income. The degree to which present income is encumbered with prior contractual claims serves as a criterion of financial decisions of the past, while the degree to which the residual is distributed characterizes current financial policies.

For the purposes of comparing income administration policies as an index of the soundness of financial management, I computed the ratios and the averages thereof which are contained in this exhibit and their bearing on the situation will, I think, become apparent as I discuss them in detail. Perhaps I should point out that none of these ratios standing by itself, affords a conclusive measure of the soundness of financial management. When considered together, however, and in relation to other factors, these ratios do provide, in my opinion, significant criteria of the wisdom of financial policies and administrations.

Q. Please describe Exhibit ..... for Identification (IV-C-5). A. That is a table showing, in respect of two groups of utilities, namely, (1) 67 independent utilities, and (2) 221 holding company subsidiaries, the following ratios relating to financial operations during the year 1939: (a) the ratio of common stock earnings, to income; (b) the ratio of common stock dividends to common stock earnings; (c) the ratio of interest plus preferred dividends to income; (d) the ratio of common stock dividends to income; (e) the ratio of earnings spent for all capital to income; (f) the ratio of earnings retained in the business to common stock earnings; and (g) the ratio of earnings retained in the business, to income.

The 288 utilities covered by this study constitute all the utilities for which the data on which this study is based were available. Measured by volume of sales the table deals

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with approximately 95% of the entire sample of 636 companies used in my major studies.

(Here offer Exhibit ..... for Identification (IV-C-5) in evidence.)

Q. What, in your opinion, does Exhibit ..... (IV-C-5) indicate with respect to the relative economy of financial management as between independent utilities and holding company subsidiaries? A. Reference to item "c" in said Exhibit shows that holding company subsidiaries have, on the average, distributed a larger portion of their income to bondholders and preferred stockholders than have independent utilities. The figures are 57.4% as compared to 49.5%. This difference, in view of the conclusion heretofore stated that holding company subsidiaries are able to raise capital on comparable terms with independent utilities, indicates a somewhat smaller common stock equity to be typical of the capital structures of subsidiaries. The resulting greater rigidity in financial payments does not, however, necessarily indicate undue lack of conservatism in the financial policies of holding company subsidiaries. The characteristic stability of the utility industry permits without great risk the financial structure typical of holding company subsidiaries as suggested by the average ratio of 57.4%, if other administrative policies are sound.

Although the holding company subsidiaries distribute slightly more of their income to their bondholders and preferred stockholders than do the independents, in the administration of residual income the holding company subsidiaries appear to be more conservative than the independents. As shown by items "a" and "b" on Exhibit ..... (IV-C-5), not only is the portion of income available to common stockholders less in the case of holding company subsidiaries, as might reasonably be expected in view of higher prior charges, but it also appears that the portion of that residual income distributed to common stockholders is also small in the case of holding company subsidiaries. Thus, while the independent utilities distributed an average of 69.2% of available income to common stock, the sub-

sidiaries distributed but 54.9%. This difference in the distributed portion of residual income is so great that, despite relatively higher fixed charges, subsidiaries on the average spent only approximately as much of their total income for capital as did independents, and similarly each group reinvested about the same portion of their earnings. (Items (e) and (g).)

Certainly, the evidence wholly fails to support any charge that holding companies are milking their subsidiaries by means of excessive dividend declarations. Neither higher fixed charges nor holding company control deprived holding company subsidiaries of funds for reinvestment because the amount of income available for that purpose averaged the same for holding company subsidiaries as for independent utilities.

Q. Now, in addition to the studies relating to the cost of bond money and preferred stock money and to income administration ratios, did you undertake any further analysis with respect to the relationship between the character of control over operating utilities and the effectiveness of their financial management? A. Yes.

Q. Will you please describe such further analysis. A. Because of the hue and cry that had been raised throughout the decade of the nineteen thirties about the scarcity of equity capital in all kinds of businesses, including the public utility business, I made an effort to ascertain the facts regarding the relationship, if any, of holding company control to the availability of equity capital for operating utilities. It has just been pointed out that, in terms of income retained in the business, there was very little difference in the amount of reinvested earnings made available to independent utilities and holding company subsidiaries, respectively, during 1939. As shown by Exhibit ..... (IV-C-5), the independent utilities, on the average, reinvested 12.3% of their income, while holding company subsidiaries reinvested 11.8% of theirs. I undertook to develop the facts also with respect to the availability of *new* or *additional* equity capital as between the two major groups of utilities involved in my studies.

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Q. Please describe the nature of this last-mentioned study and the general procedure which you followed in developing it. A. I made a compilation of all instances of increases in residual equity on the part of operating electric and gas utilities during the two year period 1939 and 1940. I might here interpolate that this particular study was not made until 1941 and that the data in question were available for the full year of 1940. I included in the compilation all cases where the residual or common stock equity of an operating electric or gas utility was increased by any means other than reinvestment of earnings. There are thus included in the compilation not only sales of common stock for cash, in which event, of course, new funds are made available to the enterprise, but also conversion of debt to stock. Instances of the latter type were included because such increases in the residual equity tend to strengthen a company as much as does the acquisition of additional equity capital.

Q. From what sources, generally, did you secure the requisite information? A. For the most part, from releases of the Securities and Exchange Commission under the Public Utility Holding Company Act and from reports of the Securities and Exchange Commission under the Securities Act. The former were examined to insure inclusion in my compilation of all transactions between registered holding companies and their respective subsidiaries which represented the furnishing of capital or equity to such subsidiaries. The latter were used as the chief source of my information regarding public offerings of equity securities by independent utilities. In addition, so far as independent utilities are concerned, I relied to some extent on information secured from standard investment services and individual company reports to stockholders.

Q. In connection with the compilation which you have described, did you have prepared a table of eight pages entitled, "Details of Holding Company Advances to Subsidiaries; 1939 & 1940"? A. Yes.

(Have Exhibit IV-C-6 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-C-6) prepared under your supervision? A. Yes.

Q. Do you believe the information set forth therein to be accurate? A. I do.

Q. What were the sources of the data set forth on Exhibit ..... for Identification (IV-C-6)? A. The series of releases of the Securities and Exchange Commission under the Public Utility Holding Company Act, to which I have referred.

Q. Please describe Exhibit ..... for Identification (IV-C-6). A. It is a list or table which shows the details of each of the financial transactions between holding companies and their respective subsidiaries during 1939 and 1940 which involved either cash advances to such subsidiaries or forgiveness of debt or cancellation of preferred stock of such subsidiaries. The table shows as to each such transaction the names of the parent and subsidiary companies involved, the amount of cash or debt or preferred stock involved, the consideration furnished by each party to the transaction, and the number of the Securities and Exchange Commission release from which the data were secured. Appended to the table are some rather voluminous footnotes which assist in the explanation of some of the transactions.

Perhaps I should add that in making up this compilation, donations by holding companies to their subsidiaries of common stock of the latter have been ignored as neither providing additional funds nor materially improving the recipient's financial standing. As a matter of fact, there was only one instance of that sort of thing during 1939 and 1940. Moreover, mergers have been ignored unless the residual equity ratio of the resulting company was greater than the consolidated ratio of the companies merged. In several instances intra-system indebtedness was reduced by merging the debtor and creditor companies without any resulting improvement in the credit standing of the combined companies.

Q. Did you have prepared a table designed to summarize the data set forth on Exhibit ..... for Identification (IV-C-6), said table being entitled, "Summary of Subsidi-

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ary Financing by Holding Companies; 1939-40; Classified by Type of Advance." A. Yes.

(Have Exhibit IV-C-7 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-C-7) prepared under your supervision? A. Yes.

Q. Is it an accurate summary of data shown on Exhibit ..... for Identification (IV-C-6)? A. It is.

Q. What was Exhibit ..... for Identification (IV-C-7) designed to accomplish? A. It classifies all the instances of increases in the residual equity of holding company subsidiaries listed on Exhibit ..... for Identification (IV-C-6) as between purchases of common stock and capital contributions. Although "capital contributions" are listed separately on Exhibit ..... for Identification (IV-C-7), such contributions are essentially of the same nature as common stock purchases, at least in those cases where the holding company owns 100% of the stock of the subsidiary. Parenthetically, I may say that most of the holding company subsidiaries are 100% owned. I might point out that the capital contributions listed on Exhibit ..... for Identification (IV-C-7) are of two types, one in which cash is contributed without consideration and the other in which debt is forgiven or preferred stock cancelled without common stock being issued in exchange therefor. I wish also to point out that the capital contributions shown on Exhibit ..... for Identification cover only the period from January 23, 1940 to the end of 1940, data with respect to such contributions not being available prior to January 23, 1940.

In addition, Exhibit ..... for Identification (IV-C-7) shows the aggregate amount of holding company subsidiary bonds retired in exchange for preferred stock, the aggregate amount of various types of credit advances by holding companies to subsidiary companies and a few miscellaneous transactions. Although such latter transactions do not fall within the definition of residual equity financing, they have been included on the Exhibit as forms of financing by hold-

ing companies of their subsidiaries. The table does not reflect the refinancing of bonds and preferred stocks with the same type of security even though the interest cost or dividend cost has been reduced as a result of such refinancing.

Q. What do Exhibits ..... (IV-C-6) and ..... (IV-C-7) for Identification show with respect to contributions of residual equity money to holding company subsidiaries during the years 1939 and 1940? A. They show that during such two years holding companies contributed to subsidiary companies a total of $98,256,739 of residual equity money, including capital contributions.

Q. Were there any instances of public offerings of common stock by holding company subsidiaries during the years 1939-1940? A. There was one such case. In April, 1940, West Penn Power Company, a direct subsidiary of the West Penn Electric Company and a part of the American Water Works & Electric Company system, publicly offered 160,000 shares of common stock at a total offering price of $4,320,000.

Q. What then is the total amount of residual equity capital acquisitions by holding company subsidiaries during the years 1939-1940? A. The total figure is $102,576,439.

Q. How does the figure you have just stated compare with the amount of residual equity capital raised by independent utilities during 1939 and 1940? A. Public offerings of common stock for purposes of raising new capital have been rare in the past decade. In the two years 1939-40 there were only two such public offerings of common stock by utilities. Private issues of common stock were more numerous during this period, but there was only one such issue by an independent utility and that was effected not through a sale of stock but through the conversion of debentures.

Commonwealth Edison Company offered its common stock in exchange for its outstanding debentures in accordance with the conversion terms of the indenture at the rate of four shares of $25 par value stock for each $100 debenture. Pursuant to such conversion rates, $40,232,600 par

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amount of Commonwealth Edison debentures were converted into common stock in 1939, and $52,340,600 par amount of debentures were so converted in 1940, making a total conversion of $92,573,200 for the two years. Besides these conversions, Commonwealth Edison Company in 1939 issued $9,583,550 par value of its own common stock in exchange for the preferred stock of Western United Gas and Electric Company, a wholly owned subsidiary. The amount of said exchange added to the amount of said conversions makes a total equity capital increase for Commonwealth Edison Company during the two-year period in question of $103,809,270.

Q. What general conclusions do you draw from this survey of the availability of equity capital to independent utilities and holding company subsidiaries, respectively? A. On the basis of this analysis it appears that holding companies supplied nearly one hundred million dollars of common stock equity to their operating subsidiaries during the two years 1939 and 1940. It also appears that during the same period only one independent utility made any significant increase in its residual equity capital. The public money markets were used but little either by subsidiaries or independents as sources of common equity money. So far as holding company subsidiaries are concerned intrasystem transactions accounted for practically all increases in residual capital equities.

The studies which I have made constitute no index of the relative needs for increased equities, but they do indicate a more widespread availability of equity funds to holding company subsidiaries than to independent utilities at a time when the public markets have, for all practical purposes, been closed to common stock offerings. It may be that the hundred million dollars of equity contributions by holding companies to their subsidiaries during the two-year period in question constitute but a small sum for the public utility industry as a whole, nevertheless said sum was distributed among seventy operating utilities in need of equity funds. During the two years in question, Commonwealth Edison Company alone among the independent

utilities achieved a significant equity increase and that was done by conversion of bonds into common stock.

While there is but a slight difference in the total amounts of equity money received by the two types of companies during this two-year period, it is worth noting that the only independent company which effected an equity increase in any considerable amount, the Commonwealth Edison Company, compares in size with the larger holding company systems. It rather clearly appears that holding companies provided a source of equity funds for small subsidiaries which was not matched in any way for the small independent utilities.

Q. Do you think that regulation by the S.E.C. under the Sections 6 and 7 of the Act had anything to do with the decisions resulting in increases in the equity of the seventy operating subsidiaries of holding companies that had increases in equity capital? A. I have no doubt that it did although the evidence in respect to such matters is hard to determine accurately. In any case the facts are that the present conditions of operation produced the results which I have outlined, whether the impetus came from the desire of the holding company to improve the equity of its subsidiaries or whether it came from pressure from the Securities and Exchange Commission.

Q. Can you summarize briefly the results of all your studies relating to financial management of utilities? A. Although the analyses of financial management indexes which I have discussed are not entirely satisfactory from a statistical viewpoint, they do provide, in effect, a series of panoramas, taken from different angles, which, while not possessing three dimensional clearness, do provide recognizable pictures. By all of these bases of comparison which adapt themselves to statistical treatment, I have concluded that there are no significant overall differences between independent utilities and holding company subsidiaries on the score of sound and efficient financial management.

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IV-C-1
(III-A-1a)

Exhibit .....

YIELDS AND COSTS ON MORTGAGE BONDS SOLD BY ELECTRIC AND GAS-ELECTRIC UTILITIES; 1938 AND 1939*

	Amounts Offered		Average Net Cost		Average Yield		Average Per Annum Cost Differential†	
	Par Value	Number of Issues	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted
1938								
Independents	$ 217,982,000	6	3.46%	3.42%	3.34%	3.30%	0.12%	0.12%
Subsidiaries	462,725,000	30	3.71	3.68	3.56	3.56	0.15	0.13
Total	$ 680,707,000	36	3.63%	3.64%	3.49%	3.52%	0.14%	0.13%
1939								
Independents	$ 45,250,000	9	3.93%	4.05%	3.66%	3.73%	0.26%	0.32%
Subsidiaries	566,332,000	37	3.57	3.76	3.44	3.60	0.13	0.15
Total	$ 611,582,000	46	3.59%	3.81%	3.45%	3.63%	0.14%	0.18%
1938 and 1939‡								
Independents	$ 263,232,000	15	3.54%	3.80%	3.40%	3.56%	0.14%	0.24%
Subsidiaries	1,029,057,000	67	3.63	3.72	3.49	3.58	0.14	0.14
Total	$1,292,289,000	82	3.61%	3.74%	3.47%	3.58%	0.14%	0.16%

* Based on data published by the Securities and Exchange Commission in "Security Issues of Electric and Gas Utilities" (both public and private sales included).

† Figured from the difference between net cost based on net proceeds to issuer after all fees and expenses, and yield to investor based on offering price.

‡ Similar averages have been computed for 1940 issues, not here included; they do not change the relative picture.

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Exhibit _____

IV-C-3 (III-A-1b) INTEREST COSTS AND COVERAGE FOR BONDS ISSUED BY OPERATING UTILITIES JANUARY 1, 1938 TO OCTOBER 16, 1940

No.*		Par Amount	Price to Investor	Gross Proceeds to Issuer	Cost to Issuer	Pro Forma—Times Interest Coverage
1-I	Commonwealth Edison Company 3½/68	$ 33,000,000	$103.50	$101.50	3.42%	4.85
2-I	Commonwealth Edison Company 3½/68	33,000,000	102.25	100.25	3.49	4.85
3-S	Indianapolis Power & Light Company 3¼/68	32,000,000	100.00	98.00	3.86	3.18
4-I	New York Steam Corporation 3½/63	27,982,000	100.00	98.00	3.62	3.04
5-I	Public Service Company of Northern Illinois 3½/68	80,000,000	103.00	101.00	3.45	3.16
6-I	Public Service Electric & Gas Company 3¼/68	10,000,000	104.75	102.75	3.11	4.82
7-I	Washington Gas Light Company 4/63	8,500,000	101.00	101.00	3.94	2.58
8-S	Appalachian Electric Power Company 4/63	57,000,000	98.75	96.25	4.24	3.36
9-S	Central Illinois Public Service Company 3¼/68	38,000,000	100.50	98.50	3.83	2.90
10-S	Consumers Power Company 3½/67	9,000,000	102.00	100.00	3.50	3.32
11-S	Consumers Power Company 3¼/66	10,168,000	104.50	102.50	3.12	3.32
12-S	Green Mountain Power Corporation 3¼/63	7,750,000	101.50	99.50	3.78	2.87
13-S	Gulf States Utilities Company 4/66	10,000,000	104.00	102.00	3.88	2.19
14-S	Michigan Consolidated Gas Company 4/63	34,000,000	97.50	95.00	4.33	3.23
15-S	Ohio Power Company, The 3¼/68	55,000,000	101.50	99.50	3.28	4.59
16-S	San Antonio Public Service Company 4/63	16,500,000	99.00	96.75	4.21	2.89
17-S	Toledo Edison Company, The 3½/68	30,000,000	101.50	99.50	3.53	3.47
18-S	Virginia Electric and Power Company 3½/68	37,500,000	103.50	101.50	3.42	4.07
19-S	Wisconsin Electric Power Company 3½/68	54,500,000	103.50	101.50	3.42	3.34
20-I	Commonwealth Edison Company 3½/68	34,000,000	104.00	104.00	3.29	4.85
21-S	Connecticut Light and Power Company 3¼/68	15,000,000	104.92	104.92	3.00	3.65
22-S	Indiana General Service Company 3¼/68	6,500,000	101.50	101.50	3.17	4.81
23-S	Iowa Power & Light Company 4/68	5,700,000	102.75	102.75	3.85	2.43
24-S	West Penn Power Company 3¼/68	17,000,000	104.92	104.92	3.00	4.91

* I—Independent companies.
S—Subsidiary companies.
E—Eliminated from computation of regression lines in Exhibit III-A-1b because affected by threat of T. V. A. competition and threat of loss of Paducah (Ky.) franchise within two months of offering date.
Z—Eliminated because the issue comprised part of a reorganization plan; proceeds were used to retire and replace defaulted bonds.
Numbers refer to points plotted on chart Exhibit _____ (IV-C-2).

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IV-C-3
(III-A-1b) (concluded)

Exhibit ..... (concluded)

No.*		Par Amount	Price to Investor	Gross Proceeds to Issuer	Cost to Issuer	Pro Forma—Times Interest Coverage
25-I	Community Public Service 4/64	$ 6,600,000	$100.00	$ 97.25	4.18%	2.10
26-I	Consolidated Gas Electric and Power (Baltimore) 3/69	7,000,000	105.00	103.00	2.85	3.53
27-I	Pennsylvania Water and Power Co. 3¼/64	10,900,000	104.00	102.00	3.13	4.22
28-S	Central Illinois Electric and Gas Co. 3¼/64	14,750,000	100.50	98.50	3.84	2.85
29-S	Central Power and Light Co. 3¼/69	25,000,000	101.00	99.00	3.81	3.45
30-S	Gulf States Utilities Co. 3½/69	27,300,000	106.75	104.75	3.25	3.66
31-S	Iowa Public Service Co. 3¼/69	14,250,000	101.00	99.00	3.81	2.83
32-S	Kansas Power and Light Co. 3½/69	26,500,000	108.50	106.50	3.166	3.70
33-S	Kansas Power Co. 4/64	5,000,000	101.50	99.50	4.03	2.34
34-S	New York State Electric & Gas Corp. 3¼/64	13,000,000	102.00	100.00	3.75	2.47
35-S	Northern Indiana Public Service Co. 3¼/69	45,000,000	100.00	98.00	3.86	2.96
36-S	Northern States Power Co. (Wis.) 3½/64	17,500,000	106.00	104.00	3.265	3.28
37-S	Pennsylvania Power & Light 3½/69	95,000,000	105.50	103.50	3.32	2.94
38-S	Public Service Co. of Colorado 3½/64	40,000,000	102.00	100.00	3.50	4.51
39-S	Public Service Co. of Indiana 4/69	38,000,000	102.00	100.00	4.00	2.81
40-S	Rochester Gas & Electric Corp. 3¼/69	8,323,000	105.50	103.50	3.07	2.58
41-S	Southwestern Light & Power 3¼/69	6,750,000	102.00	100.00	3.75	3.47
42-S	Washington Water Power Co. 3½/64	22,500,000	105.00	103.00	3.32	4.61
43-S	West Texas Utilities 3¼/69	18,000,000	101.75	99.75	3.76	3.02
44-I	Southern California Edison Co. 3¼/64	30,000,000	104.37	104.37	3.00	3.58
45-S	Indiana & Michigan Electric Co. 3¼/69	22,500,000	103.00	103.00	3.10	3.52
46-S	New York Power & Light Co. 3¼/64	66,582,000	104.14	104.14	3.50	2.84
47-S	Northwestern Electric 4/69	6,700,000	100.00	100.00	4.00	4.15
48-I	Indianapolis Power & Light Co. 3¼/70	32,000,000	104.50	102.50	3.12	3.79
49-I	Iowa Southern Utilities Co. 4/70	10,000,000	101.00	99.00	4.06	3.72
50-I	Pennsylvania Water & Power Co. 3¼/70	10,962,000	105.00	103.00	3.10	5.05
51-I	Southern California Edison Co., Ltd. 3/65	108,000,000	104.00	102.25	2.87	4.51
52-I	Southern California Gas Co. 3¼/70	30,000,000	103.50	101.50	3.12	5.60
53-S	Central Maine Power Co. 3½/70	18,100,000	107.50	105.50	3.21	2.76
54-S	Cleveland Electric Illuminating Co. 3/70	50,000,000	105.50	103.50	2.83	5.99
55-S	Consumers Power Company 3¼/70	18,594,000	105.50	103.50	3.07	3.41
56-S	Dayton Power & Light Company 3/70	25,000,000	104.00	102.25	2.85	4.58
57-S	Jersey Central Power & Light Co. 3½/65	38,000,000	102.50	100.50	3.43	3.30
E	Kentucky Utilities Company 4/70	20,000,000	102.00	100.00	—	—
58-S	Northwestern Public Service Company 4/70	6,000,000	102.50	100.50	3.97	3.22
59-S	Southwestern Gas & Electric Co. 3¼/70	16,000,000	103.00	101.00	3.20	5.66
60-I	Iowa Electric Light & Power Co. 3½/65	12,600,000	100.00	100.00	3.50	3.89
61-I	Public Service Electric & Gas Co. 3/70	15,000,000	101.50	101.50	2.90	4.98
62-S	Carolina Power & Light Co. 3¼/65	46,000,000	103.50	103.50	3.54	2.89
63-S	Kansas Gas & Electric Co. 3¼/70	16,000,000	105.00	105.00	3.12	4.10
Z	Mountain States Power Co. 4¼/65	7,500,000	100.00	100.00	—	—
64-S	Northern Indiana Power Co. 4¼/65	9,500,000	100.00	100.00	4.25	2.57
65-S	Rochester Gas & Electric Corp. 3¼/70	15,000,000	105.00	105.00	3.10	3.06

IV-C-4
(III-A-2)

Exhibit .....

YIELDS AND COSTS ON PREFERRED STOCKS SOLD BY ELECTRIC AND GAS-ELECTRIC UTILITIES; 1938 AND 1939*

	Amounts Offered		Average Net Cost		Average Yield		Average Per Annum Cost Differential†	
	Par Value	Number of Issues	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted
1938								
Independents	$ 1,257,200.00	2	5.98%	6.54%	5.30%	5.50%	0.68%	1.04%
Subsidiaries	7,528,067.00	4	5.24	5.42	5.03	5.18	0.21	0.24
Total	$ 8,785,267.00	6	5.35%	5.79%	5.07%	5.29%	0.25%	0.50%
1939								
Independents	$10,443,550.50	4	5.27%	4.94%	5.11%	4.80%	0.16%	0.14%
Subsidiaries	10,953,950.00	6	5.23	5.41	5.01	5.17	0.22	0.24
Total	$21,397,500.50	10	5.25%	5.22%	5.06%	5.02%	0.19%	0.20%
1938 and 1939‡								
Independents	$11,700,750.50	6	5.34%	5.47%	5.13%	5.03%	0.20%	0.44%
Subsidiaries	18,482,017.00	10	5.23	5.41	5.02	5.18	0.21	0.24
Total	$30,182,767.50	16	5.28%	5.43%	5.06%	5.12%	0.21%	0.31%

* Based on data published by the Securities and Exchange Commission in "Security Issues of Electric and Gas Utilities" (both public and private sales included).

† Figured from the difference between net cost based on net proceeds to issuer after all fees and expenses, and yield to investor based on offering price.

‡ Similar averages have been computed for 1940 issues, not here included; they do not change the relative picture.

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IV-C-5
(III-B-1)

Exhibit .....

INCOME ADMINISTRATION RATIOS OF INDEPENDENT AND SUBSIDIARY UTILITIES; CLASSIFIED ACCORDING TO TYPE OF CONTROL, 1939

	Independent Companies	Holding Company Subsidiaries	Total
Number of Companies	67	221	288
(a) Common Stock Earnings as Per Cent of Income	50.5	42.6	44.4
(b) Common Dividends as Per Cent of Common Stock Earnings*	69.2	54.9	57.9
(c) Interest Plus Preferred Dividends as Per Cent of Income. 100%—(a)	49.5	57.4	55.6
(d) Common Stock Dividends as Per Cent of Income	38.2	30.8	32.5
(e) Earnings Spent for All Capital as Per Cent of Income (c)+(d)	87.7	88.2	88.1
(f) Earnings Retained as Per Cent of Common Stock Earnings* 100%—(b)	30.8	45.1	42.1
(g) Earnings Retained as Per Cent of Income 100%—(e)	12.3	11.8	11.9

*Average computed excluding 22 companies neither earning nor paying common stock dividends; 10 independents and 12 subsidiaries.

Source of Data: Moody's 1940 Manual of Public Utilities.

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IV-C-6
(III-C-2)

Exhibit .....

DETAILS OF HOLDING COMPANY ADVANCES TO SUBSIDIARIES: 1939-40

HC Act Release No.	Date[1]	Parent[2]	Subsidiary	Amount[3]	Consideration Given: By Parent	Consideration Given: By Subsidiary
			1939			
1393	1/ 6/39	Southern Union Gas Co.	Arkansas Western Gas	$ 125,000.00	Bonds cancelled	Preferred stock
1462	3/ 7/39	New England Public Service Co.	Central Maine Power Co.	500,000.00[4]	Open account discharged	Common stock
1471	3/21/39	Northern States Power of Minn.	Northern States Power of Wis.	16,980,000.00	" " "	" "
				4,447,200.00	Preferred stock cancelled	" "
1497	4/17/39	" " " " "	" " " " "	2,511,905.25	Bonds cancelled	" "
1533	5/17/39	Southwestern Electric	Kansas Utilities Missouri Utilities Texas New Mexico Utilities	1,250,000.00[5]	Capital assets	Bonds
1535	5/17/39	Inland Power & Light	Michigan Public Service	210,500.00	" "	"
1570	6/12/39	Standard Gas & Electric	Mountain State Power	6,947,292.00[6]	Open account discharged	Common stock
1577	6/ 9/39	United Public Utilities	Dakota Public Service Co.	300,165.00	Preferred stock cancelled[7]	" "
1601	6/26/39	American Gas & Elecrtic	Indiana & Michigan Electric	2,000,000.00	Cash[8]	" "
1633	7/18/33	Continental Gas & Electric	Iowa-Nebraska Light & Power	2,000,000.00	" " "	" "
1636	7/18/39	Washington & Rockville Ry.	Braddock Light and Power	50,000.00	" " "	" "
1647	7/24/39	American Utilities Service Co.	Petoskey Gas Co.	1,900.00	Open account discharged[9]	
				160,000.00	Bonds cancelled	Common stock
1648	7/24/39	" " " "	Minnesota Utilities Co.	102,000.00	Cash	" "
1701	8/28/39	Cities Service Power & Light	Public Service Co. of Colorado	2,190,000.00	Bonds cancelled	" "
1705	8/30/39	American States Utilities Corp.	Edison Sault Electric Co.	60,000.00	Cash	" "
1741	10/ 4/39	Minneapolis General Electric	St. Croix Falls Wis. Improvement	1,500,000.00	Bonds cancelled	" "
				277,000.00	Assets—securities of a sub.[10]	" "
				271,000.00	Bonds cancelled[11]	" "
		" " "	St. Croix Falls Minn. Improvement	379,000.00	Bonds cancelled[11]	" "
				258,000.00	Open account discharged	" "
1766	10/30/39	American Power & Light	Portland Gas and Coke	600,000.00	Cash	" "
1809	11/30/39	New England Public Service Co.	Central Maine Power Co.	500,000.00[4]	Open account discharged	" "
1810	11/30/39	Northern Natural Gas	Peoples Natural Gas	1,000,000.00	Income note surrendered[12]	" "
				10,000.00	" " " [12]	Bonds
				540,000.00	Cash[12]	"
		" " "	Argus Natural Gas	40,000.00	" " "	"
1825	12/ 7/39	North American Co.	Wis.-Mich. Power Co.	200,000.00	" " "	Common stock
1843	12/30/39	Peoples Light & Power Co.	California Public Service Co.	62,000.00[13]	Open account discharged	" "
1854	12/28/39	Commonwealth Southern Corp.	Consumers Power Co.	3,524,187.50	Cash	" "

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IV-C-6—continued (1940)

Exhibit ..... (continued)

HC Act Release No.	Date1	Parent2	Subsidiary	Amount3	Consideration Given: By Parent	Consideration Given: By Subsidiary
			1940			
1863	1/ 3/40	N. Y.-Pa.-N. J. Utilities	Owego Gas Corp.	$ 81,600.00	Cash	Common stock
1916	2/ 7/40	North Continent Utilities	Great Northern Utilities	90,000.00	"	
1917	2/ 7/40	Eastern Shore Public Service Co.	Eastern Shore Public Service of Maryland	126,800.00[14]	"	Common stock
		" " " " "		158,700.00[14]	Open account discharged	" "
			Eastern Shore Public Service of Virginia	15,610.00[14]	Cash	Bonds
1921	2/ 9/40	United Light & Power	Peoples Light Co.	125,000.00	"	Open account debt
1922	2/ 9/40	" " " "	Iowa City Light & Power Co.	100,000.00	"	
1934	2/20/40	Utility Service Co.	Marion Reserve Power Co.	910,100.00	Preferred stock cancelled	Common stock
1965	3/ 5/40	Middle West Corp.	Kentucky Utilities	500,000.00	Cash	
1970	3/11/40	American Gas & Electric	Appalachian Electric Power	1,200,000.00	"	
		" " " "	Ky. & W. Va. Power Co.	250,000.00	"	Open account debt
1971	3/11/40	Cities Service Power & Light	East Tenn. Light & Power	271,000.00	Open account discharged	Common stock
1986	3/19/40	Continental Gas & Electric Corp.	Panhandle Power & Light	330,000.00	Cash	
1995	3/28/40	United Light & Power Co.	LaPorte Gas & Electric Co.	130,000.00	"	
2000	1/ 2/40	" " " " "	Ottumwa Gas Co.	80,000.00	"	
2007	4/ 8/40	United Public Utilities Corp.	Indiana-Ohio Public Service	10,000.00	"	Open account debt
2014	4/15/40	New England Gas & Electric	Kittery Electric Light	20,000.00	"	" " "
2017	4/17/40	" " " " "	Provincetown Light & Power	22,500.00	"	" " "
2025	4/24/40	Walnut Electric & Gas Corp.	Oklahoma Electric & Water Co.	6,537.50	"	Bonds
2026	4/24/40	North American Co.	Wis. Electric Power	2,000,000.00[15]	Preferred stock cancelled	Common stock
2037	4/30/40	Central & Southwest Utilities	Southwestern Gas & Electric	1,300,000.00	Cash	" "
2067	5/23/40	Central States Edison Inc.	Sedan Gas Co.	8,500.00	"	" "
2068	5/23/40	North American Co.	St. Louis County Gas Co.	80,000.00	Open account discharged	" "
				1,020,000.00	Cash	" "
2071	5/24/40	Consolidated Electric & Gas	Roanoke Gas Co.	118,815.00	Guarantee of payments[16]	
2080	5/31/40	Columbia Gas & Electric	Hamilton Service Co.	50,000.00	Cash	Open account debt
2081	6/ 3/40	Southeastern Electric & Gas	South Carolina Electric & Gas	500,000.00	Subordination of debt[17]	
2117	6/17/40	New England Gas & Electric Ass'n	Cape & Vineyard Electric Co.	150,000.00	Cash	Open account debt
2128	6/24/40	United Light & Power	Fort Dodge Gas & Electric Co.	100,000.00	"	Bonds
		" " " "	Peoples Light Co.	475,000.00	"	"
		" " " "	Peoples Power Co.	250,000.00	"	"
2163	7/10/40	North Continent Utilities	Great Northern Utilities Co.	40,000.00	"	
2186	7/24/40	Columbia Gas & Electric	Manufacturers' Light & Heat	536,663.00	"	Bonds
		" " " "	Manufacturers' Gas Co.	1,100,000.00	"	"
		" " " "	Penn. Fuel Supply Co.	150,592.00	"	"

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IV-C-6—continued (1940) **Exhibit ..... (continued)**

HC Act Release No.	Date[1]	Parent[2]	Subsidiary	Amount[3]	Consideration Given By Parent	Consideration Given By Subsidiary
2187	7/24/40	Federal Water Service Corp.	Chattanooga Gas Co.[18]	$ 500,000.00	Preferred stock cancelled	———
		" " " "	" " " [18]	1,511,922.08	Debt cancelled	———
2188	7/27/40	Southeastern Electric & Gas	Florida Public Service Co.	642,500.00	Cash	———
		" " " "	" " " "	357,500.00	Open account discharged	———
2189	7/25/40	American Utilities Service Corp.	La. Public Service Corp.	50,000.00	Cash	Common stock
		" " " "	Wis. Southern Gas Co.	162,500.00	"	" "
2253	8/23/40	General Public Utilities Inc.	Gulf Public Service Co.	4,013,000.00	Bonds cancelled	" "
		" " " "	" " " "	948,784.00	Open account discharged	" "
2261	8/26/40	Monongahela West Penn. Public Service Co.	West Maryland Power	35,000.00	Cash	———
2267	8/28/40	Central U. S. Utilities	Union Gas & Electric Co.	173,000.00	"	———
2270	8/31/40	American Utilities Service	Minnesota Utilities Co.	130,000.00	"	Common stock
2323	10/ 9/40	Federal Water Service Corp.	Alabama Water Service Corp.	500,000.00	Open account discharged	———
		" " " "	" " " "	364,352.94	Bonds cancelled	Preferred stock
2329	10/17/40	Consolidated Electric & Gas Co.	The Salem Gas Light Co.	24,684.00	" "	———
		" " " "	" " " " "	8,133.12	Open account discharged[19]	———
2346	10/25/40	Inland Power & Light	Michigan Public Service Co.	620,134.24	Bonds cancelled	———
2367	11/ 2/40	North American Co.	Wis. Mich. Power Co.	575,000.00	" "	Common stock
2370	11/ 7/40	Central States Power & Light	Central States Power & Light of Okla.	463,241.89	Open account discharged	———
		" " " " "	Central Light & Power	164,476.80	" " "	———
2385	11/19/40	National Gas & Electric Corp.	National Utilities Co. of Mich.	525,000.00[20]	Bonds cancelled	Common stock
2386	11/20/40	Cities Service Power & Light	Danbury & Bethel Gas & Electric Light	379,000.00	" "	" "
		" " " " "	" " " " " "	29,040.00	Open account discharged[21]	" "
2399	11/30/40	Citizens Utilities Co.	Public Utilities Calif. Corp.	100,000.00	Cash	———
2409	12/ 7/40	New England Gas and Electric Assoc.	Provincetown Light & Power	280,000.00	Open account discharged	Common stock
2430	12/14/40	American Gas & Electric	Appalachian Power Co.	13,656,625.24[22]	" " "	———
		" " " "	" " "	17,013,848.29[22]	Preferred stock cancelled	———
2448	12/27/40	Peoples Light & Power Co.	California Public Service Co.	145,000.00	Cash	Common stock
		Total Transactions Accounted for		$104,677,309.85		

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Exhibit ..... (footnotes)

IV-C-6 (footnotes)

Footnotes

1. Date of Holding Company Act Release. Where the finding and opinion of the Commission and the order are released separately the date of the former is used.

2. The immediate contributor of funds is given, even though the funds were actually received from a more remote parent.

   Date of approval governs date given for reorganization plans, provided that there is sufficient evidence that the plan approved was put into effect during the period observed.

3. Amounts are given gross, exclusive of expenses incidental to the transaction.

   Where debt is exchanged for stock, the principal amount of debt cancelled governs the amount.

   Where preferred stock is exchanged for common, the par on stated value of the preferred stock is determining unless otherwise indicated.

   In case of advances, the maximum authorized is recorded, although the actual advance might have been less.

4. The exchange for common stock was apparently contemplated at the time the cash advances for construction purposes were made. The common stock was first to be offered to public holders of old common and 6 per cent cumulative preferred stock at $100 a share in accordance with their preemptive rights, the proceeds from any stock thus absorbed to be tendered to New England Public Service Company. The maximum portion of stock to be thus offered is 3.7 per cent, and in view of the high offering price and the past experience with similar transactions, the amount expected to be taken is negligible.

5. An involved transaction whereby a loan by the Reconstruction Finance Corporation to Community Power and Light Company was used in part by the latter to lend $1,250,000 to its subsidiary, Southeastern Electric Company, which used the funds to construct facilities to be sold to three subsidiaries for their notes. The transaction was not broken down between the three subsidiaries since the total of the individual loans authorized exceeded the authorized aggregate maximum.

6. Part of a reorganization plan.

7. Securities relinquished are those of two predecessor companies, merged to form Dakota Public Service Company.

8. Although superficially a cash transaction, the proceeds were to be used, according to agreement, to retire debt owed the parent. This is a part of a plan approved in which bonds and notes were to be issued publicly in order to retire bonds held by the parent—with the result that the parent company's cash position was improved by the transaction.

9. An income note of $23,500 was accepted in full payment of an open account of $25,400.

10. The transfer of all securities of two subsidiaries to a third in exchange for the common stock of the latter. The net assets of the two subsidiaries after books are adjusted to original cost basis determine the amount.

11. Actually the Minnesota Company paid its bonded debt of $650,000 held by the parent, Minneapolis General Electric, by issuing $379,000 of its own stock and $271,000 of the stock of the Wisconsin Company which it

Exhibit ..... (footnotes concluded)

IV-C-6 (footnotes concluded)

had acquired in discharging an open account indebtedness of the Wisconsin Company. The same result could have been achieved had the Wisconsin Company in consideration of the discharge of its own debt to the Minnesota Company assumed $271,000 of the bonded debt of the latter and then issued its common stock direct to Minneapolis General Electric in payment of the assumed debt. Since the various transactions are but part of a single plan, the method of achieving the desideratum outlined above shall be assumed to have occurred as being more susceptible to our mode of description.

12. One single transaction arbitrarily broken down. An income note of $1,010,000 was cancelled and $540,000 in cash paid for $550,000 of bonds and $1,000,000 in stock of the subsidiary. It is hardly conceivable that the exchange of an income note for bonds with a fixed interest charge would have been approved if passed upon separately.

13. Part of an approved plan to refund the debt and to reclassify the stock of California Public Service. The net effect of the plan is to reduce the part played by the parent in financing California by using the proceeds from a bond issue sold to insurance companies to pay a bonded and open account indebtedness owed to Peoples Light & Power Company.

14. Issues approved were much larger, but the difference was used to refund previously existing debt to parent.

15. North American Company also received 58,710 shares of common stock in addition to 58,710 shares of new 4½ per cent preferred in exchange for 58,710 shares of old 6 per cent preferred. Since the par value of preferred stock outstanding was unchanged from this transaction, the additional common stock was not included in the totals.

16. Guarantee of payments for construction work for the benefit of Roanoke Gas Company.

17. An agreement of Southeastern Electric and Gas Company to subordinate all debt owed by its subsidiary South Carolina Electric and Gas Company to a note of the latter for $500,000 to be held by the President and Directors of the Manhattan Company.

18. Part of a transaction whereby Chattanooga Gas Company becomes a subsidiary of Federal Water Service Company.

19. Accrued interest on notes relinquished.

20. Part of merger of National Utilities Company of Michigan with Michigan Fuel Light Company. The bonds of the latter were surrendered for common stock of the former. Also an unstated amount of debt of Michigan Fuel Light Company was forgiven.

21. Accrued interest on bonds relinquished.

22. Although stated as a cash contribution, it was understood that the cash would be used to retire the securities held by the parent.

Preferred stock valued at cost to American Gas & Electric Company.

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Exhibit .....

IV-C-7
(III-C-2)

SUMMARY OF SUBSIDIARY FINANCING BY HOLDING COMPANIES: 1939-40; CLASSIFIED BY TYPE OF ADVANCE

COMMON STOCK PURCHASES:		
Cash	$ 8,135,587.50	
Other assets given	277,000.00	
Funded debt exchanged	16,928,905.25	
Open accounts discharged†	27,014,816.00	
Preferred stock exchanged	7,657,465.00	
CAPITAL CONTRIBUTIONS:‡		
Cash contributions	3,420,500.00	
Funded debt surrendered	2,156,740.32	
Open accounts forgiven	15,151,877.05	
Preferred stock surrendered	17,513,848.29	
Total residual equity increase		$ 98,256,739.41
Bonds retired in exchange for preferred stock		489,352.94
CREDIT ADVANCED:		
Cash purchase of funded debt	$ 4,094,902.50	
Other assets given for funded debt	580,000.00	
Cash advances on open account‡	627,500.00	5,302,402.50
MISCELLANEOUS TRANSACTIONS:		
Income note retired in exchange for bonds§		10,000.00
Guarantee of debt		118,815.00
Subordination of old debt to new		500,000.00
Total holding company financing		$104,677,309.85

* The transactions here summarized are listed in detail in Schedule III.

† $6,947,292 represents an open account discharged in reorganization of debtor, hence not a wholly voluntary transaction.

‡ See footnote page 3. A contribution of $1,900 was reported in 1939 and hence included. Otherwise amounts restricted to contributions and loans after January 23, 1940.

§ Part of another transaction. Otherwise it would have been ignored.

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Q. Will you now turn to the fourth section of your first major group of studies, namely, that designed to show the relationship between the character of control over operating utilities and the protection of investors in such utilities. First, please state whether you think it is possible to measure statistically the relative protection afforded to investors in different groups of utilities. A. In my opinion it is when there are a sufficient number of utilities in the sample on which comparisons may be based.

Q. What bases of comparison did you select for measuring protection of investors in operating utilities? A. Investors in corporate securities are primarily interested in two characteristics of their investment, namely, safety of principal and certainty of income. Protection of their interests implies, therefore, assurances that these qualities will be maintained; and when the question is raised whether one company or group of companies affords greater "investor protection" than another, it is, in effect, the question of degree of safety of principal and certainty of income that is involved and is to be compared. This is particularly true when one is considering utility bonds and preferred stocks in respect of which the investment contracts are normally drawn on a non-participating basis, thus limiting the investor to fixed returns with little or no opportunity for appreciation in principal value.

Q. You mentioned utility bonds and preferred stocks. Does your study extend to the relative protection accorded to investors in utility common stocks? A. No, I have not attempted to cover that angle. A consideration of the elements contributing to the value of common stocks involves additional factors, such as the opportunity for appreciation in value. There is little point to making comparisons between the protection afforded to investors in common stocks of independent utilities and that afforded to investors in common stocks of holding company subsidiaries because common stocks of holding company subsidiaries are, of course, largely held by holding companies and are not directly available to investors.

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Q. Will you state the manner in which you have undertaken to compare "safety of principal and certainty of income" as between holders of bonds and preferred stocks of independent utilities, on the one hand, and holders of bonds and preferred stocks of holding company subsidiaries, on the other hand? A. An accepted measure of investment quality in bonds consists of the "times interest earned" ratio; that is to say, the number of times the annual bond interest requirements of an issuer are covered by the annual earnings of the issuer. This concept can be used to measure both the quality of safety of principal and the quality of certainty of income, because a bond whose interest payments are assured by adequate coverage is, by the same token reasonably assured of payment at maturity; either there is sufficient value to meet the maturity directly, or it can be refinanced with minimum difficulty. The adequacy of this measure, subject to certain qualifications and supplementary tests which I shall mention later, has many times been demonstrated and its common acceptance is evidenced by the fact that, within certain limits, investors themselves express their ideas of value in correlation with the interest coverage factor. It is well known, for instance, that investors pay less for bonds as the interest coverage decreases and that there is a sharp upturn in bond yields when utility bond interest is earned less than 2½ or 3 times. (In support of this statement I refer to Chart 10, p. 114, of a publication of the Federal Communications Commission under date of June 15, 1938, entitled, "The Problem of the 'Rate of Return' ".) This refusal of the investor to pay as much for a bond whose interest is earned less than 2½ or 3 times as he will for a bond whose interest is earned more than 2½ or 3 times is the investor's practical answer to the implied increase in risk of income and principal that comes with smaller interest coverage.

In a similar fashion, the overall annual earnings coverage of interest and preferred dividends is used to measure the risk, or adequacy of protection, affording preferred stockholders. They stand next in the income stream after the holders of interest bearing securities, and their chances

of receiving dividends depend on the corporation's ability to meet all interest payments with enough left over to pay the preferred dividends. Just as in the case of bonds, there is a demonstrable sharp drop in preferred stock prices when the overall earnings coverage becomes less than 1½ or 2 times. (See, for example, Charts 21, and following in the publication of the Federal Communications Commission to which I have just referred.)

In addition to the "times interest earned" and "times interest and preferred stock dividends earned" ratios, my analysis also takes cognizance of another concept for testing the quality of investment in utility bonds and preferred stocks, namely, the amount of operating revenues remaining after the payment of bond interest and preferred stock dividends, respectively. Because the "times coverage" measures are based on but two variables, namely, the operating income and interest and dividend charges, they fail to express completely the ability of an issuer to meet its obligations. To illustrate, high coverage of interest requirements may either be the result of low ratio of income to gross revenue and a very small amount of debt, or of high ratio of income to gross revenue and a greater amount of debt. Therefore, considerable significance, from the point of view of investor protection, is attached to a measure which expresses the extent to which gross revenues may decline, or, to express it differently, the extent to which the volume of business may be reduced, before there is danger of default in payment of interest or preferred stock dividends. Hence, as a second test or measure of protection to investors and as a supplement to the times coverage factor, I have used the factor of the average balances of gross revenue remaining (1) after all interest charges and (2) after all interest charges plus preferred stock dividends.

As a third test of the quality of investor protection, I have used the amount of income, that is, operating profits, remaining for the common stock equity after payment of all prior charges. While this factor is itself obviously affected by the amounts of earnings, interest, and preferred dividends, it tends to reflect a significantly different view

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of the same elements. This is so because it serves to isolate for observation the amount of profits left over after satisfaction of all claims prior to common stock, that is, the amount of earnings available for management to administer for the benefit of all security holders by using it according to its best judgment. Whether in a particular case, the dictates of management are sound or unsound, the administrable amount of profits is significant because it represents the available funds which *can* be used to improve the protection of prior claim security holders if the management so desires.

Q. In connection with the study we are now discussing, have you caused to be prepared a table entitled "Investor Protection Ratios for Independent and Subsidiary Utilities, Classified According to Type of Control, 1939"? A. Yes.

(Have Exhibit IV-D-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-D-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-D-1). A. It is a table showing various ratios for the year 1939 in respect of two groups of utilities, namely, a group of independent utilities, and a group of holding company subsidiaries. The table shows in respect of the bonds and preferred stocks of each of said groups, the average number of times bond interest has been earned, the average percentage of gross revenue remaining after payment of bond interest, the average number of times the bond interest plus preferred stock dividends have been earned, the average percentage of gross revenue remaining after payment of both bond interest and preferred stock dividends, and the average ratio of common stock earnings to total income.

Q. I note that Exhibit ..... for Identification (IV-D-1) does not appear to cover all the 636 operating utilities which constitute the entire sample on which your major

studies are based. What is the reason for that? A. Of the 636 companies which constitute my complete sample, only 288 companies publish financial statements in sufficient detail and have financial structures that lend themselves to the particular analysis represented by Exhibit ..... for Identification (IV-D-1). As shown on the face of the table, of said 288 companies, 60 independents and 210 subsidiaries afford data as to bond interest coverage, while only 36 independents and 161 subsidiaries have preferred stock in their structures. All 288 of said companies, namely, 67 independents and 221 subsidiaries, show administrable profits available to common stock.

Q. Do you regard the sample upon which Exhibit ..... for Identification (IV-D-1) is predicated as adequate? A. Yes. Most of the companies for which the data in question are missing are small companies. Measured by volume of sales, the table deals with approximately 95% of the entire sample of 636 companies used in my major studies.

Q. What types of utilities are covered by this study? A. It covers all electric utilities and all combined electric and gas utilities for which the data in question were available. It does not cover exclusively gas utilities. Accordingly, the conclusions which may be derived from the various analyses apply directly only to electric utilities and those which may, as a larger or smaller incident of their corporate existence, include gas and other incidental operations. It is, of course, possible that the inclusion of the so-called combined electric and gas companies may introduce some incomparability of data, but inasmuch as both independent utilities and holding company subsidiaries include some such combination units it is believed that the sample is more representative than it would be if the combined electric and gas companies were omitted, especially since the exclusion of these combined companies would reduce the sample to insignificant numbers.

Q. Does the fact that Exhibit ..... for Identification (IV-D-1) is confined to the year 1939 affect the validity of the statistical conclusions indicated thereon? A. In

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my opinion, no. Since the main object of the study is to establish *relationships* between investments in different groups of utilities and not to evaluate the financial status of the investments in any particular utility or group of utilities as of any particular time, a comparison of the factors involved for nearly any recent year or period should be valid. Furthermore, since the year 1939 was neither good nor bad in terms of general business conditions, there should be no untoward influences in that year which would spoil the reasonable effect of averages drawn from companies the country over.

(Here offer Exhibit ..... for Identification (IV-D-1) in evidence.)

Q. What does Exhibit ..... (IV-D-1) show with respect to the relative protection afforded to bondholders of independent utilities and bondholders of holding company subsidiaries? A. It shows that the interest coverage is on the average higher in the case of independent utilities than in the case of subsidiary companies, the ratios being, respectively, 7.4 and 4.0.

Q. What, in your opinion, is the significance of this difference? A. In theory, at least, the chances of default in payment of interest or principal are less for independent utilities than in the case of holding company subsidiaries. The difference in the degree of such chances, however, is not proportionately measured by the arithmetic difference between the "times interest earned" figures of 7.4 and 4.0, respectively.

Assume, for example, that a company's earnings are such that its interest is earned 4 times. If this is the case, it necessarily follows that income would have to drop more than 75% before the company would fail to earn its interest charges. For a company whose interest charges are earned 7.4 times (which is the average interest coverage for the independent utilities covered by my present study) it would be similarly true that income would have to drop more than 86.5% to go below the interest level. Therefore, interpretation of the significant difference between 7.4 times interest

coverage and 4 times interest coverage really involves the contemplation of income decreases of 86.5% and 75%, respectively. Knowledge of the earning characteristics of public utilities in general would indicate that there is little or no difference in the economic possibilities on a cyclical basis of either of such earning declines; both are almost beyond the realm of possibility. If conditions should develop to cause a 75% drop in profits, an 86.5% drop would be almost equally possible.

For contrast, consider an interest coverage of 2 times which needs only a 50% drop in earnings to reach the interest level, and a coverage of 1½ times which can stand but a 33⅓% reduction.

It is this series of relationships which effectively measures the risks of the investors, and as the interest coverage increases the added increments contribute successively less to the practical safety of the investment involved. For utilities, the significance of increased interest coverage beyond 3½ or 4 times interest earned is at a minimum because of the economic characteristics of the industry which practically preclude a cyclical decrease in earnings as great as 75%.

The bond market, as the reflector of investor opinions regarding quality and protection, bears out this reasoning. Market prices of bonds, when converted to a yield basis, show that investors think very little of increased interest coverage over and above 3½ or 4 times. When you consider, first, that long term government bonds currently sell on a 2 to 2½% basis and, second, that utility bonds with interest coverage as low as 3 times sell on a 2¾-3% basis, there is little room left for anything better.

Q. To support your conclusion regarding the significance of the difference between the interest coverage ratios of independents and holding company subsidiaries, have you caused to be prepared a table entitled "Frequency Distribution of the 'Times Interest Earned' Performance among Independent and Subsidiary Utilities"? A. Yes.

(Have Exhibit IV-D-2 marked Exhibit ..... for Identification.)

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Q. Was Exhibit ..... for Identification (IV-D-2) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-D-2). A. It is a table showing the number and percentage of both independent utilities and holding company subsidiaries falling within each of six classifications of the "times interest earned" ratio, said classifications ranging from interest earned less than 1½ times to interest earned more than 3½ times.

(Here offer Exhibit ..... for Identification (IV-D-2) in evidence.)

Q. What does this Exhibit indicate with respect to the particular point you have been discussing? A. It shows that, relatively, there are fewer holding company subsidiaries with really poor bond issues, that is, bonds having an interest coverage of less than 1½ times, than there are independent utilities having really poor bond issues. The respective percentages are 11% and 18%. It also shows that holding company subsidiaries exhibit fewer instances of bonds with a very high interest coverage, that is, coverage in excess of 3 times, than do the independent utilities—the respective figures being 28% and 45%. It further shows that 61% of the bonds of holding company subsidiaries fall within the "in-between" classes or medium coverage classes, namely, from 1½ times to 3 times interest coverage, whereas only 37% of the bonds issued by independents fall within said "in-between" or medium coverage classes. Accordingly, for whatever significance there may be in the interest coverage factor, it may be concluded that the independent utilities in general appear as having the very best and the very worst bond issues whereas the bonds issued by holding company subsidiaries are concentrated in the medium coverage classes.

Q. Have you any opinion as to why, looking at the picture as a whole, the average interest coverage on bonds issued by independent utilities is higher than that on bonds

issued by holding company subsidiaries? A. Yes. It will be brought out in a later exhibit that approximately 40% of all the independent utilities are small companies having total revenues of less than $1,000,000 per annum whereas only 17% of the holding company subsidiaries fall in that category; and, further, that bonds issued by small utilities tend to show a higher interest coverage than bonds of large utilities. These facts suggest that the limited marketability of small bond issues may result in fewer bonds being sold by small utility companies. This would result in higher average interest coverage for small companies, which in turn would lead to a higher average interest coverage for independent utilities since a much larger percentage of independent utilities are small companies.

Q. Will you now state what Exhibit ..... (IV-D-1) shows with respect to the average percentage of gross revenue remaining after payment of all bond interest charges as between independent utilities and holding company subsidiaries? A. On the score of the balance of revenues remaining after interest payments, there is no real difference between the averages for independent and subsidiary utilities, the respective figures being 16.5% and 16.3%. This may be taken to indicate that independent and subsidiary utilities could on the average suffer equal declines in gross revenue, namely, 16 per cent., with no reduction in expenses, before interest payments would not be earned. Accordingly, notwithstanding the fact that, on the average, interest coverage on bonds of the independents is higher than that on bonds of subsidiaries, the financial structures and profit ratios of the independent utilities are such that after paying interest charges and operating expenses they have no greater percentage of revenue remaining than do the holding company subsidiaries.

Q. In order graphically to illustrate the limitations upon the "times interest earned" ratio as a measure of protection to investors, and its relation to the "revenue balance" ratio have you prepared a chart entitled, "Comparison of 'Interest Coverage' and 'Revenue Balance' as Measure of Bondholders' Protection"? A. Yes.

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(Have Chart IV-D-3 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-D-3) prepared by you or under your supervision? A. Yes.

Q. What does the chart which is now Exhibit ..... for Identification (IV-D-3) show? A. It presents a picture of two hypothetical companies which I describe as Company A and Company B, each having gross revenues of $1,000,000. Company A has bonds outstanding on which the interest is earned 7.4 times. Company B has bonds outstanding on which the interest is earned 4 times. The capital structure and operating expenses of Company A are such that it has 16.5% of its revenues remaining after payment of operating expenses and interest charges. The capital structure and operating expenses of Company B are such that it has 16.3% of its revenue remaining after payment of operating expenses and interest charges. Under these stated conditions, Company A's operating income must be $190,781, its interest charges $25,781, its net income after interest charges $165,000, and its operating expenses $809,-219. Similarly, Company B's operating income must be $217,333, its interest charges $54,333, its net income after interest charges $163,000, and its operating expenses $782,-667. It is apparent from a glance at the two bars representing Companies A and B on Exhibit ..... for Identification (IV-D-3) that the chances that the revenues of the two hypothetical companies will not be sufficient to pay their respective operating expenses and interest charges are substantially the same even though the interest coverage for the bonds of Company A is nearly twice that for the bonds of Company B. It must, of course, be recognized in such a comparison as that set forth on this chart that nothing is implied regarding the flexibility of either company's operating expenses nor the extent to which such expenses could be contracted if revenue declines should occur; the chart is designed solely to show that, in spite of wide differences in interest coverage, each hypothetical company could stand the same decrease in revenue without having to reduce ex-

penses and without failing to cover interest requirements. The existence of this relationship between interest coverage and balance of revenue remaining after payment of interest charges is another explanation of why market reactions to high interest coverage on bonds is often tempered when expressed in bond prices and yields.

(Here offer Exhibit ..... for Identification (IV-D-3) in evidence.)

Q. In order to check the significance of the figures you have just mentioned, have you caused to be prepared a table entitled, "Frequency Distribution of 'Balance after Interest as Per Cent of Revenue' among Independent and Subsidiary Utilities"? A. Yes.

(Have Exhibit IV-D-4 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-D-4) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-D-4). A. It is a table showing the number and percentage of both independent utilities and holding company subsidiaries falling within each of six classifications of percentages of balance of gross revenue remaining after payment of all interest charges, said classifications ranging from less than 10% to over 30%.

(Here offer Exhibit ..... for Identification (IV-D-4) in evidence.)

Q. What does Exhibit ..... (IV-D-4) indicate with respect to the protection accorded to investors in bonds of the two groups of utilities in question? A. It shows that the percentages of independent utilities and subsidiary companies falling within each of the stated classifications are closely similar, and that, therefore, based on this test, the protection afforded to investors by both groups of utilities in

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question is substantially identical. It may be pointed out that the independent utilities show a slightly greater percentage of companies falling in the poorest or lowest classification of percentages of gross revenue remaining after payment of interest charges; but, in general, it may be said that this Exhibit indicates that, on the basis of this particular test, there is no real distinction between the two groups of utility companies in question so far as the degree of excellence of their respective bonds is concerned.

Q. Looking at all of your studies dealing with utility bonds, what is your general conclusion as to the relative degree of protection afforded to bondholders by independent utilities and by holding company subsidiaries? A. No one can say that as a group independent utilities afford significantly better protection to the holders of their bonds than do holding company subsidiaries; nor, of course, may the reverse be said. While the figures as to the average "times interest earned" ratios would at first blush indicate some superiority on the part of bonds of independent utilities, when such figures are broken down and analyzed in the manner I have indicated, it is my opinion that no investment analyst could properly conclude that the bonds of independent utilities as a whole tend to be better than those of holding company subsidiaries or that holding company subsidiary bondholders as a group tend to be accorded less protection than independent utility bondholders.

Q. Having discussed the relative protection accorded to utility bondholders, I now direct your attention to that part of Exhibit ..... (IV-D-1) which deals with the relative protection accorded to holders of utility preferred stocks. First, have you anything to say as to the sample used in your study of what you refer to on said exhibit as "Preferred Stock Protection"? A. Since this study relates to preferred stock, it was necessary to eliminate from the 288 companies, with which I started my study of protection to investors, all companies having no preferred stock outstanding. These eliminations reduced this particular sample to 36 independent utilities and 161 subsidiary companies. The preferred stock issues of these 197 util-

ities, however, constitute a very large percentage of all utility preferred stocks outstanding.

Q. Do you regard this sample as adequate for your purpose? A. It is hard to answer that question "yes" or "no." The sample is hardly adequate for statistical treatment if the data based thereon is to be regarded independently of other studies. This applies particularly to the statistical instability that would be expected with respect to the independent utilities group which contains only 36 companies upon which to base the average figure. When, however, such data are read in light of other studies and the conclusions to be drawn therefrom, I believe that this particular sample is reasonably adequate for my purposes.

Q. What does Exhibit ..... (IV-D-1) show with respect to coverage of preferred stock dividends as between independent utilities on the one hand, and holding company subsidiaries on the other hand? A. As might be expected from our observation of interest coverages, the average overall preferred dividend coverage of independent utilities is somewhat higher than that of holding company subsidiaries. Thus, it appears that the independent utilities earn on the average 2.4 times their combined preferred dividend and interest requirements whereas holding company subsidiaries on the average earn 1.7 times their combined preferred dividend and interest requirements.

Q. What significance do you attach to the greater average preferred stock dividend coverage on the part of independent utilities as indicated by Exhibit ..... (IV-D-1)? A. The significance of such greater coverage is materially affected by the lack of stability in the averages, particularly for the independent utilities which are only 36 in number. To illustrate what I mean, the higher average coverage of preferred dividends in the case of the independent utilities can be explained in part by the presence in the group of isolated companies with very high coverages. Thus, two companies alone out of the 36 companies in this group, Tampa Electric Company, with an overall preferred stock dividend coverage of 19.69 times, and Concord Electric Company, with an overall preferred stock dividend cov-

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erage of 10.56 times, violently affect the average figures for all the independents. Had these two instances not occurred, the average coverage for all independents would have been 1.7 instead of 2.4; that is, precisely the same as the average for holding company subsidiaries.

The two examples I have just given illustrate the danger of using a simple average to typify a group where the number in the group is small and the dispersions within the group are considerable. They suggest the use of a frequency distribution to reveal the dispersion within the group.

Q. In order to secure such a frequency distribution and to test the significance of the figures as to preferred dividends coverage, have you prepared a table entitled, "Frequency Distribution of Overall Preferred Dividend Coverage among Independent and Subsidiary Utilities"? A. Yes.

(Have Exhibit IV-D-5 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-D-5) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-D-5). A. It is a table showing the number and percentages of both independent utilities and holding company subsidiaries falling within each of five classifications of the number of times combined interest and preferred stock dividends have been earned, said classifications ranging from interest and dividends earned less than once to interest and dividends earned more than 2½ times.

(Here offer Exhibit ..... for Identification (IV-D-5) in evidence.)

Q. What does this table indicate with respect to the particular point you have been discussing? A. It shows that only 7% of the holding company subsidiaries had earnings insufficient to cover their preferred stock dividend

requirements whereas 28% of the independent utilities had earnings insufficient to cover their preferred dividend requirements. 93% of the holding company subsidiaries at least earned their preferred stock dividends whereas this can be stated of only 72% of the independent utilities. The independent utilities show extremes of performance. Thus, whereas 25% of such companies earned their preferred stock dividends more than twice, 28% thereof failed to cover their preferred stock dividend requirements even once. In this connection, I may point out parenthetically, the fact that Tampa Electric Company earned its preferred dividends 19.69 times is small comfort to the preferred stockholders of 28% of the independent utilities which failed to earn their preferred dividends even once.

In the light of this table it is clear that the figures showing a higher average preferred dividend coverage on the part of the independent utilities cannot be relied upon as tending to prove that the position of the preferred stockholders of the independents is superior to that of the preferred stockholders of holding company subsidiaries. On the contrary, the present table reveals a greater uniformity of coverage on the part of the latter.

Q. In light of the data set forth on Exhibit ..... (IV-D-5), what is your opinion as to the significance of the fact that, according to Exhibit ..... (IV-D-1), the overall preferred stock dividend coverage is greater for independent utilities than in the case of holding company subsidiaries. A. In my opinion the data showing a preferred dividend coverage of 2.4 times for independent utilities as compared with a figure of 1.7 times for holding company subsidiaries cannot be relied on as showing superior quality on the part of preferred stocks of independent utilities because the few companies comprising the sample and the erratic nature of their ratios make possible the domination of the average by such extreme cases as those of the Tampa Electric Company and the Concord Electric Company. Moreover, as I have pointed out, analysis of the dividend coverage data on a frequency distribution basis reveals a greater uniformity of cover-

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age among the holding company subsidiaries. Since the typical utility preferred stock, the income from which is limited to a fixed annual amount, does not benefit proportionately by successive increments of interest coverage, I am inclined to believe that the typical investor in preferred stocks of subsidiary companies, 93% of which earn their dividend requirements at least once, is actually more fortunately situated than the investor in the preferred stocks of independent companies, of which only 72% earn their dividend requirements. This conclusion is borne out by a further breakdown of the dividend coverage data as between utilities falling in several size classifications, to which I shall refer in a moment.

Q. Will you now state what Exhibit ..... (IV-D-1) indicates with respect to the average percentage of gross revenue remaining after payment of interest and preferred dividends as between independent utilities and holding company subsidiaries? A. When the test of balance of gross revenues remaining after the payment of preferred dividends is observed by itself, it appears that the average percentage for holding company subsidiaries is slightly more favorable than for the independents, the respective figures being 10.1% and 9.2%.

Q. In order to be in a better position to evaluate the significance of the figures as to average percentage of revenue remaining after payment of preferred dividends, have you prepared a table entitled, "Frequency Distribution of 'Balance after Preferred Dividends as Per Cent of Gross Revenue' among Independent and Subsidiary Utilities"? A. Yes.

(Have Exhibit IV-D-6 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-D-6) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (IV-D-6). A. It is a table showing the number and per-

centage of both independent utilities and holding company subsidiaries falling within each of six classifications of percentages of balance of gross revenue remaining after payment of preferred stock dividends, said classifications ranging from less than 5% to over 25%.

(Here offer Exhibit ..... for Identification (IV-D-6) in evidence.)

Q. What does Exhibit ..... (IV-D-6) show with respect to the relative protection accorded to investors in preferred stocks of the two groups of utilities under discussion? A. While the data are too few and too unstable to serve as an absolutely sure basis of comparison, this table shows statistically that there is a larger percentage of independent utilities than holding company subsidiaries in the weakest or poorest classification of percentages of gross revenue remaining after payment of preferred stock dividends, the figure being 41% in the case of independent utilities and only 25% in the case of holding company subsidiaries. On the other hand, the independents have a slightly larger figure in the two strongest classifications, the figures here being 12% and 8%, respectively. The result, of course, is that the holding company subsidiaries have the greatest concentration in the middle ranges, the figure being 67% for the subsidiaries as compared with the figure of 47% for the independents in the classifications ranging from 5% to 20% balance of gross revenue remaining after payment of dividends. This table thus serves to substantiate the observation which I made on the basis of earnings coverage of preferred stock dividends to the effect that preferred stocks of holding company subsidiaries do not run to either extreme of investment quality to the same extent as do the preferred stocks of independent utilities.

Q. Now, have you further broken down the figures as to average coverage of preferred stock dividends and as to average balance of revenue remaining after payment of preferred stock dividends, as shown on Exhibit ..... (IV-D-1) in order to assay their significance with respect to the

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relative protection accorded to preferred stockholders by the two groups of utilities here involved? A. Yes.

Q. In what manner? A. By making a comparison of the average coverage of preferred stock dividends and the average balance of revenue remaining after payment of preferred stock dividends of smaller groups comprising the sample of 197 companies reflected on Exhibit ..... (IV-D-1).

Q. In that connection, have you prepared a table entitled, "Distribution of Preferred Stock Protection Ratios of Independent and Subsidiary Utilities among Companies of Various Sizes (1939)"? A. Yes.

(Have Exhibit IV-D-7 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (IV-D-7) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

(Here offer Exhibit ..... for Identification (IV-D-7) in evidence.)

Q. What does Exhibit ..... (IV-D-7) indicate with respect to the average coverage of preferred stock dividends and average balance of revenue remaining after payment of preferred dividends as between independent utilities and holding company subsidiaries? A. This subsampling of the data in question by company size groups indicates that there is no consistent advantage accruing to preferred stockholders of independent utilities, whether the test be average dividend coverage or average balance of gross revenue after preferred stock dividends. In four out of the eight size classes, which are underlined on Exhibit ..... (IV-D-7) the holding company subsidiary preferred stocks appear at a significant advantage. In the other four classes, the independent utility preferred stocks appear to be the sounder ones, although the difference in their favor is less significant. In my opinion, it is definitely impossible

to establish a better performance for either group of companies on a statistical basis.

Q. What does Exhibit ..... (IV-D-1) show with respect to the balance of operating profits remaining after payment both of bond interest and preferred stock dividends as between the two groups of utilities being compared? A. The subdivision of Exhibit ..... (IV-D-1), entitled "Balance of Income" shows that, on the average, bond interest and preferred stock dividends together take about 50% of the income of independent companies, leaving the other 50% as administrable common stock earnings. By comparison, holding company subsidiaries use 57% of income for bond interest and preferred dividend payments, leaving a balance of 43% as administrable common stock earnings. In both instances, the averages indicate that on a comparative basis, the two groups of companies each had sizeable average balances of income that could be used as occasion might require. Moreover, as we have seen in Exhibit ..... (IV-C-5), the holding company subsidiaries were more conservative in the distribution of residual earnings. There thus appear to be no differences in policy which would distinguish the two groups, on the basis of conservatism, in overall profit distribution.

Q. Looking at Exhibits ..... (IV-D-1) to ....., (IV-D-7), collectively, will you state your general conclusion with respect to the relationship between the character of control exercised over utilities and the protection to investors in securities of such utilities? A. My studies suggest the conclusion that if one were to invest in public utility securities at random he would have a better chance of getting a reasonably safe security if he made his choice from securities of holding company subsidiaries than if he made his choice from securities of independent utilities; and while he might have a better chance of acquiring a security with a very high fixed charge coverage if he made his selection from the securities of independent utilities, at the same time he would run a greater risk of getting a bond with insufficient interest coverage or a preferred stock with no coverage at all. But whatever may be the situation in that respect, I

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am convinced that the fact that a utility is controlled by a holding company has no tendency to cause the securities of such utility to be of a less desirable character than would be the case if such utility were not controlled by a holding company, nor does control by a holding company have any tendency to result in less protection to the holders of the securities of an operating utility than would otherwise be the case. In other words, I think that there is no real or inevitable relationship between holding company control over utilities and the protection accorded to investors in the securities of operating utilities.

Exhibit ____

IV-D-1
(IV-A-1)

INVESTOR PROTECTION RATIOS FOR INDEPENDENT AND SUBSIDIARY UTILITIES, CLASSIFIED ACCORDING TO TYPE OF CONTROL, 1939

	Independents	Holding Company Subsidiaries	Total
Bond Protection			
Number of Companies	60	210	270
Average Times Interest Earned	7.4	4.0	4.7
Average Per Cent Gross Revenue Remaining after Interest	16.5	16.3	16.4
Preferred Stock Protection			
Number of Companies	36	161	197
Average Times Dividends and Interest Earned	2.4	1.7	1.8
Average Per Cent Gross Revenue Remaining after Preferred Dividends	9.2	10.1	9.9
Balance of Income			
Number of Companies	67	221	288
Average Common Stock Earnings as Per Cent of Income	50.5	42.6	44.4

Source of Data: Moody's 1940 Manual of Public Utilities.

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Exhibit .....

IV-D-2
(IV-A-pg. 3)

FREQUENCY DISTRIBUTION OF "TIMES INTEREST EARNED" PERFORMANCE AMONG INDEPENDENT AND SUBSIDIARY UTILITIES; 1939

Class Interval	Independents		Subsidiary Companies	
	No. of Companies	Per Cent Total	No. of Companies	Per Cent Total
Less than 1.5x	11	18%	23	11%
1.5 to 2x	7	12	60	28
2 to 2.5x	10	17	38	18
2.5 to 3x	5	8	31	15
3 to 3.5x	6	10	17	8
Over 3.5x	21	35	41	20
Totals	60	100%	210	100%

Source of Data: Moody's 1940 Manual of Public Utilities.

Exhibit ___

IV-D-4
(1V-A-pg. 6)

FREQUENCY DISTRIBUTION OF "BALANCE AFTER INTEREST AS PER CENT OF GROSS REVENUE" AMONG INDEPENDENT AND SUBSIDIARY UTILITIES 1939

Bal. after Int. Payment as Per Cent of Gross Revenues	Independents		Subsidiaries	
	No. of Companies	Per Cent of Total	No. of Companies	Per Cent of Total
Less than 10.0%	12	20%	33	16%
10.0 to 15.0	15	25	56	26
15.1 to 20.0	12	20	63	30
20.1 to 25.0	14	23	34	16
25.1 to 30.0	4	7	18	9
Over 30.0%	3	5	6	3
Total	60	100%	210	100%

Source of Data: Moody's 1940 Public Utility Manual.

Exhibit .....

D-5
V-A-pg. 10)

FREQUENCY DISTRIBUTION OF OVERALL PREFERRED DIVIDEND COVERAGE AMONG INDEPENDENT AND SUBSIDIARY UTILITIES 1939

Times Interest Plus Preferred Dividends Earned	Independents		Subsidiaries	
	Number of Companies	Per Cent of Total	Number of Companies	Per Cent of Total
ess than 1.00 time	10	28	11	7
01 to 1.50 times	13	36	81	50
51 to 2.00 times	4	11	33	20
01 to 2.50 times	2	6	17	11
Over 2.50 times	7	19	19	12
Total	36	100	161	100

Source of Data: Moody's 1940 Public Utility Manual.

Exhibit

IV-D-6
(IV-A-pg. 12)

FREQUENCY DISTRIBUTION OF "BALANCE AFTER PREFERR DIVIDENDS AS PER CENT OF GROSS REVENUE" AMONG INDEPENDENT AND SUBSIDIARY UTILITIES 1939

Balance after Preferred Dividend Requirement as Per Cent of Gross Revenue	Independents		Subsidiaries	
	Number of Companies	Per Cent of Total	Number of Companies	Per Ce of To
Less than 5.0%	15	41%	40	25
5.0 to 10.0	6	17	50	31
10.1 to 15.0	4	11	27	17
15.1 to 20.0	7	19	31	19
20.1 to 25.0	2	6	8	5
Over 25.0%	3	6	5	3
Total	36	100%	161	100

Source of Data: Moody's 1940 Public Utility Manual.

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IV-D-7
(IV-A-pg. 8)

Exhibit .....

DISTRIBUTION OF PREFERRED STOCK PROTECTION RATIOS OF INDEPENDENT AND SUBSIDIARY UTILITIES AMONG COMPANIES OF VARIOUS SIZES 1939

Total Gross Revenue of Operating Company	Independents			Subsidiaries		
	No. of Companies	Average Coverage	Average Balance of Gross Rev. after Preferred Dividend	No. of Companies	Average Coverage	Average Balance of Gross Rev. after Preferred Dividend
Less than $250,000	4	1.0	4.5%	1	1.3	8.2%
$250,000-$500,000	5	1.2	4.7	3	1.6	13.3
$500,001-$1,000,000	5	4.1	11.7	9	1.6	6.7
$1,000,001-$3,000,000	6	1.3	8.0	41	1.5	7.4
$3,000,001-$5,000,000	4	6.1	14.2	23	1.7	9.6
$5,000,001-$10,000,000	3	0.9	0.5	37	1.6	10.7
$10,000,001-$20,000,000	2	1.1	3.6	28	1.8	12.1
Over $20,000,000	7	2.8	16.9	19	1.9	13.7
Total Companies	36	2.4	9.2%	161	1.7	10.1%

Source of Data: Moodys 1940 Public Utility Manual.

Q. Having completed your description of the studies dealing with the relationship between holding company control over utilities and the objectives of the Act, I now direct your attention, Dr. Waterman, to the second major group of studies, namely, those designed to determine what relationship exists, if any, between the size of utilities and the objectives of the Act. Will you at this point briefly state again the general outline of this second group of studies. A. As in the case of the studies relating to the character of control over utilities, this second group of studies seeks to determine the relationship between the variable of size of operating company and four factors, namely, (1) the cost of electric service to consumers, (2) economy in the management and operation of utilities, (3) economy in financial management of utilities, and (4) protection of investors in utilities.

Q. In connection with the first section of this second group of studies, did you cause to be prepared a table entitled, "Weighted Average Typical Electric Bills Charged by Electric Utilities; Classified by Size of Company, as of January 1, 1940"? A. Yes.

(Have Exhibit V-A-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (V-A-1) prepared by you or under your supervision? A. Yes.

Q. Does it show on its face the source of the data set forth thereon? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (V-A-1). A. Said Exhibit is a table which classifies the 636 electric utilities comprising my entire sample into eight classifications according to the size of the utility, the size being measured by total electric revenues for the year 1939. For example, the smallest size of company classification includes utilities having total electric revenues of over $250,000; the largest size classification includes utili-

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ties having total electric revenues of over $20,000,000. The table shows, as to the group of utility companies comprising each company size classification and as to the entire 636 companies as a group, the weighted average typical bills for 25, 100 and 250 KWH of electricity, respectively. These average bills cover only residential electric service and they have been weighted according to the population served by each company size group in the manner I have previously described. The table also shows, as to the group of utilities in each company size classification, the population served, both in numbers and as a percentage of the total population, the dollar value of sales of electricity to ultimate consumers, and the percentage of total sales represented by each group, the average population served per company, and the average dollar amount of sales of electricity to consumers both per capita of population served and per company in the group. The number of utilities comprising each group is also shown.

(Here offer Exhibit ..... for Identification (V-A-1) in evidence.)

Q. What factors determined your selection of the several company size classes? A. It was desirable, of course, that each class should contain a sufficient number of utilities so that the arithmetic averages in respect thereof would be reasonably representative of the common performance of the companies in such class. I also sought to have a sufficient number of classes of increasing size so as to facilitate analysis of any trend of change which might be observed as an accompaniment of increasing size.

Q. What does Exhibit ..... (V-A-1) indicate with respect to the relationship, if any, between the size of utilities and the cost of electric service to consumers? A. It is apparent from a mere inspection of the table that customers served by large operating companies pay smaller bills for residential electric service, at all three of the use levels here employed, than do customers served by small operating companies. In fact, the table shows that, with one exception, as the operating companies increase in size the electric bills

steadily decrease in amount. It is true that, according to the table, the consistent relationship between increasing size of company and decreasing bills appears to be interrupted slightly in the largest company size classification. That is to say, the table shows that the average electric bills of the companies in the very largest size classification, the group with total electric revenues of over $20,000,000—while lower than those in the first six size groups, are slightly higher than the average bills of the utilities in the next smaller size classification, namely, the group with total electric revenues between $10,000,000 and $20,000,000. This fact, however, need not be taken as indicating that the definite relationship between increasing size of operating company and decreasing rates breaks down when the operating company becomes very large in size.

Q. How, then, do you account for the fact that on Exhibit ..... (V-A-1) the average bills of the very largest sized companies are somewhat higher than those of companies in the next smaller class? A. Although the companies in the largest size group number only 27 out of the total of 636 companies comprising the entire sample, they account for nearly half of the residential electric business. Thus, 47% of the population served by private electric companies is served by said 27 companies and 48% of the total sales of electricity by private electric companies to ultimate consumers originate with them. The performance of all the companies in the largest company size classification is influenced by the fact, which will be brought out in a later exhibit, that the independent utilities account for 56% of the total population served in that size classification whereas in the next smaller company size class the independent utilities account for only 3% of the total population served. The relatively higher level of average bills of independent utilities, as compared with those of holding company subsidiaries in all the company size classes, but particularly in the two largest, when considered in the light of the very important influence of the independent utilities in the largest company size class and their almost negligible influence in the next smaller size class, unquestionably

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accounts for the very slight increase in the average bills of all utilities in the largest company size class shown on Exhibit ..... (V-A-1). When this Exhibit ..... is broken down as between independent utilities and holding company subsidiaries, it is perfectly clear that the relationship between increasing size of company and decreasing rates does not disappear when the operating company becomes very large in size.

Q. Have you broken down the data set forth on this Exhibit as between independent utilities and holding company subsidiaries? A. Yes.

Q. In this connection, have you caused to be prepared a table entitled, "Weighted Average Typical Electric Bills Charged by Independent Companies; Classified by Size of Company, as of January 1, 1940", and another table entitled, "Weighted Average Typical Bills Charged by Subsidiary Utilities; Classified by Size of Company, as of January 1, 1940"? A. Yes.

(Have Exhibits V-A-2 and V-A-3 marked, respectively, Exhibits ..... and ..... for Identification.)

Q. Were Exhibits ..... (V-A-2) and ..... (V-A-3) for Identification prepared by you or under your supervision? A. Yes.

Q. Do they show on their face the sources of the data set forth thereon? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibits ..... and ..... for Identification. A. They are exactly similar to Exhibit ..... (V-A-1), which I have already described, except that Exhibit ..... for Identification (V-A-2) is confined to independent utilities and Exhibit ..... for Identification (V-A-3) is confined to holding company subsidiaries.

(Here offer Exhibits ..... (V-A-2) and ..... (V-A-3) for Identification evidence.)

Q. Have you also prepared a chart entitled, "Weighted Average Typical Electric Bills of Independent and Subsidiary Utilities Classified by Size of Company—January 1, 1940"? A. Yes.

(Have Chart Exhibit V-A-4 marked Exhibit ..... for Identification.)

Q. Was this chart prepared by you or under your supervision? A. Yes.

Q. Do you believe the same to be accurate? A. I do.

Q. Please describe this chart and state why it was prepared. A. This chart was designed to represent graphically the statistical data set forth on Exhibit ..... (V-A-2) and Exhibit ..... (V-A-3). In light of my description of those Exhibits and the legends at the bottom of the chart, I believe it is almost self-explanatory. The bars with diagonal lines on the chart are replicas of the average electric bill data contained in tabular form on the other exhibits mentioned. There are eight groups of bars with two bars to each group, one representing the weighted average bills of independent utilities and the other representing the weighted average bills of holding company subsidiaries. The eight groups of bars correspond to the eight company size classifications utilized in the tabular exhibits, and they are drawn to logarithmic scale vertically and to natural scale horizontally. The percentage figure under each group of bars indicates the proportion of the total population represented by my sample which is served with residential electricity by the companies in such group and the width of the bar is proportional thereto. The bars are shaded with diagonal lines in such a manner as to indicate the weighted average bills of both independent utilities and holding company subsidiaries for 25, 100 and 250 KWH of electricity, respectively.

(Here offer Exhibit ..... for Identification (V-A-4) in evidence.)

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Q. What do Exhibits ..... (V-A-2), ... (V-A-3) and ..... (Chart V-A-4) indicate with respect to the particular point you have been discussing? A. These Exhibits further illustrate the very definite tendency for the size of electric bills to decrease as the size of the operating company increases. The relationship between these two factors is clear and unmistakable, particularly as respects holding company subsidiaries. Some slight interruptions of the trend appear in the table dealing with the independent utilities, but the existence of the trend is clear and the interruptions no doubt result from the fact that the number of independent utilities in some of the company size groups is so small as to give the average figures some element of statistical unreliability.

Q. Diverting your attention momentarily from the relationship of size of operating company to the cost of electric service and reverting to the question of the relationship between holding company control and cost of electric service, I would like to ask you what Exhibits ..... (V-A-2) and ..... (V-A-3) indicate with respect to the comparative performances of independent utilities and holding company subsidiaries as measured by average electric bills? A. They show that as to all but the very smallest sized companies, which together represent less than 2% of the total sales of electricity, consumers of electricity consistently fare better at the hands of holding company subsidiaries than they do at the hands of independent utilities; that is to say, the average bills of the holding company subsidiaries are uniformly lower than those of the independents. The consistent superior performance on the part of holding company subsidiaries, at all three use levels and throughout all the various company size classes—except as to companies in the two smallest size classes—is most striking. This sub-sampling of the data as to comparative average electric bills on the basis of size of company serves strongly to emphasize the conclusion which I stated earlier to the effect that, measured by average cost of residential electric service, holding company control does not appear to operate to the detriment of the public. This is obvious

because in practically all company size groups the average bills of holding company subsidiaries are lower than those of the independent companies.

Q. You will recall that Exhibit ..... (V-A-1), which deals with all utilities, shows that the trend of decreasing electric bills with increasing size of operating company appeared to be broken in the very largest company size. What is the bearing on that fact of the breakdown studies showing the average electric bills of independent utilities and of holding company subsidiaries in the several company size groups? A. It must be borne in mind that, as I have just stated, independents have higher rates than holding company subsidiaries throughout all size classes. The bearing which the breakdown studies have on the apparent break in trend of electric bills in the very largest company size class is that these breakdowns reveal that in that class the independents predominate, whereas in the next to the largest size class there is but one and its influence is insignificant. It follows that influence of the independents and the lack thereof in the next to the largest size class tends to give the appearance of a break in trend of decreasing electric bills with size. I would like to explain this in a little more detail. Reference to Exhibits ..... (V-A-2) and ..... (V-A-3) shows that in the first five of the company size classes there are enough independent utilities and holding company subsidiaries in each class to lend statistical stability to the average. In the last three company size classes this is not uniformly true. Thus, in the sixth company size class, that is, the companies having total electric revenues between $5,000,000 and $10,000,000, there are only 5 independent utilities as compared with 52 holding company subsidiaries; and in the seventh company size class, that is, the companies having total electric revenues between $10,000,000 and $20,000,000, there is only 1 independent utility as compared with 44 holding company subsidiaries; whereas in the eighth, or largest, company size class, that is, the companies with total electric revenues of over $20,000,000, the division is about equal, there being 12 independent utilities and 15 holding com-

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pany subsidiaries. It will be noted from Exhibit ..... (V-A-3) that the average bills of the holding company subsidiaries in the next to largest size class, that is, the companies with total electric revenues between $10,000,000 and $20,000,000, are quite noticeably lower than those in the next smaller size class, and that they are also definitely lower than the average bills of the independent utilities in the $10,000,000 to $20,000,000 size class. In view of the fact that there is only *1* independent utility in the $10,000,000 to $20,000,000 size class, serving 416,840 of population, whereas in the same size class there are 44 holding company subsidiaries, serving nearly 14,000,000 of population, it is apparent that the low average bills for *all* utilities in said size class are almost completely accounted for by the performance of the holding company subsidiaries. Then it will be further noted in the Chart Exhibit ..... (V-A-4) that in the largest size class, the "over $20,000,000" class, not only are the average bills of holding company subsidiaries lower than the average bills of the independents, but also that the independents and subsidiaries share the field almost equally. In other words, in the "over $20,000,000" class there are 12 independent utilities, serving 19,000,000 of population, and 15 holding company subsidiaries, serving about 15,000,000 of population. It is obvious that the statistical influence of the independent utilities is relatively much greater in the largest company size class, the "over $20,000,000" class, than in the next smaller company size class. The statistical result is that the higher average bill influence of the independent utilities asserts itself so strongly in the "over $20,000,000" size group as to raise the average for *all* companies in that group. But, as we have seen, when the independent utilities and the holding company subsidiaries are examined separately, the relation between decreasing electric bills and increasing size of operating companies persists even in respect of the largest company size groups.

Q. Looking at all your studies as to the relationship between size of operating company and the amounts that consumers pay for electric service, what are your conclu-

sions? A. In my opinion there is no evidence whatever which indicates that the cost of electric service to consumers increases, or tends to increase, with an increase in the size of operating company. In fact, the contrary appears to be true. The studies I have described seem to answer with considerable finality the oft-repeated query as to the effects of size. It definitely appears that large companies sell electricity more cheaply than small ones, and that increasing size of operating company is accompanied by lower residential rates. From the evidence it appears that the consuming public, rather than suffering from service by large companies, is relatively better off, in terms of lower average bills for residential service, when served by large companies.

Exhibit .....

V-A-1
(I-B-1)

WEIGHTED AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY ELECTRIC UTILITIES; CLASSIFIED BY SIZE OF COMPANY, AS OF JANUARY 1, 1940

Total Electric Revenue of Operating Companies	Weighted Average Typical Bills*			Population Served†		Sales to Ultimate Consumers		No. of Companies‡	Average Population per Company	Average Sales	
	25 KWH	100 KWH	250 KWH	Number	Per Cent of Total	Amount (000)	Per Cent of Total			Per Capita	Per Company (000)
Under $250,000	$2.00	$5.17	$9.07	774,956	1.07	$ 20,781	1.02	208	3,726	26.82	$ 100
$250,000-$500,000	1.90	4.86	8.57	740,188	1.02	19,487	0.95	64	11,565	26.33	304
$500,001-$1,000,000	1.78	4.83	8.66	1,540,274	2.12	40,829	2.00	80	19,253	26.51	510
$1,000,001-$3,000,000	1.69	4.51	8.08	5,630,874	7.74	136,770	6.69	101	55,751	24.29	1,354
$3,000,001-$5,000,000	1.57	4.46	7.88	5,068,220	6.97	143,108	7.00	54	93,856	28.24	2,650
$5,000,001-$10,000,000	1.56	4.35	7.84	10,698,076	14.70	284,926	13.93	57	187,686	26.63	4,999
$10,000,000-$20,000,000	1.39	3.96	7.15	14,183,911	19.49	417,934	20.44	45	315,198	29.47	9,287
Over $20,000,000	1.45	4.07	7.39	34,124,111	46.90	981,236	47.98	27	1,263,856	28.75	36.342
Total Companies	$1.50	$4.19	$7.55	72,760,610	100.00	$2,045,071	100.00	636	114,403	28.11	$ 3,216

* Weighted by population served.

† According to 1930 U. S. Census.

‡ Companies counted in each state in which they serve.

Source of all data: Federal Power Commission Reports.

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Exhibit .....

V-A-2
(I-B-1a)

WEIGHTED AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY INDEPENDENT COMPANIES; CLASSIFIED BY SIZE OF COMPANY, AS OF JANUARY 1, 1940

Total Electric Revenue of Operating Companies	Weighted Average Typical Bills*			Population Served†		Sales to Ultimate Consumers		No. of Companies‡	Average Population per Company	Average Sales	
	25 KWH	100 KWH	250 KWH	Number	Per Cent of Total	Amount (000)	Per Cent of Total			Per Capita	Per Company (000)
Under $250,000	$1.93	$5.14	$8.89	304,127	1.26	$ 8,298	1.17	94	3,235	27.28	$ 88
$250,000-$500,000	1.93	4.85	8.38	211,399	0.88	5,044	0.71	22	9,609	23.86	229
$500,001-$1,000,000	1.83	5.03	8.85	316,335	1.31	8,606	1.22	16	19,771	27.21	538
$1,000,001-$3,000,000	1.87	4.88	8.68	931,202	3.87	24,746	3.50	21	44,343	26.57	1,178
$3,000,001-$5,000,000	1.62	4.72	8.15	1,159,627	4.82	33,629	4.76	11	105,421	29.00	3,057
$5,000,001-$10,000,000	1.72	4.52	8.15	1,307,045	5.43	41,300	5.84	5	261,409	31.60	8,260
$10,000,001-$20,000,000	1.69	5.11	8.57	416,840	1.73	12,227	1.73	1	416,840	29.33	12,227
Over $20,000,000	1.51	4.24	7.65	19,417,074	80.69	572,896	81.06	12	1,618,090	29.50	47,741
Total Companies	$1.56	$4.34	$7.79	24,063,649	100.00	$ 706,746	100.00	182	132,218	29.37	$ 3,883

* Weighted by population served.

† According to 1930 U. S. Census.

‡ Companies counted in each state in which they serve.

Source of all data: Federal Power Commission Reports.

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Exhibit .....

V-A-3
(I-B-1b)

WEIGHTED AVERAGE TYPICAL BILLS CHARGED BY SUBSIDIARY UTILITIES; CLASSIFIED BY SIZE OF COMPANY, AS OF JANUARY 1, 1940

Total Electric Revenue of Operating Companies	Weighted Average Typical Bills*			Population Served†		Sales to Ultimate Consumers		No. of Companies‡	Average Population per Company	Average Sales	
	25 KWH	100 KWH	250 KWH	Number	Per Cent of Total	Amount (000)	Per Cent of Total			Per Capita	Per Company (000)
Under $250,000	$2.05	$5.20	$9.19	470,829	0.97	$ 12,483	0.93	114	4,130	26.51	$ 110
$250,000-$500,000	1.89	4.87	8.65	528,789	1.09	14,443	1.08	42	12,590	27.31	344
$500,001-$1,000,000	1.76	4.78	8.61	1,223,939	2.51	32,223	2.41	64	19,124	26.33	503
$1,000,001-$3,000,000	1.65	4.43	7.96	4,699,672	9.65	122,024	8.37	80	58,746	23.84	1,400
$3,000,001-$5,000,000	1.56	4.38	7.80	3,908,593	8.03	109,479	8.18	43	90,898	28.01	2,546
$5,000,001-$10,000,000	1.54	4.32	7.79	9,391,031	19.28	243,626	18.20	52	180,597	25.94	4,685
$10,000,001-$20,000,000	1.38	3.93	7.11	13,767,071	28.27	405,707	30.31	44	312,888	29.47	9,221
Over $20,000,000	1.36	3.85	7.05	14,707,037	30.20	408,340	30.51	15	980,469	27.76	27,223
Total Companies	$1.47	$4.11	$7.43	48,696,961	100.00	$1,338,325	100.00	454	107,262	27.48	$ 2,948

* Weighted by population served.

† According to 1930 U. S. Census.

‡ Companies counted in each state in which they serve.

Source of all data: Federal Power Commission Reports.

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Q. Will you now describe the second section of your second major group of studies, namely, that designed to show the relationship between the size of utilities and the economy of operation and management thereof. A. In conformity with the general outline which has already been stated, this section of the studies seeks to determine what relationship, if any, the factor of size of operating company has to each of the same four indexes or measures of economy of operation and management which were used in the studies involving the relationship of holding company control to the economy of management and operation of utilities, namely, (1) average typical electric bills, (2) average executive expense, (3) average administrative and general expense, and (4) management fees. I have, of course, already explained these four indexes or measures and stated why they were selected.

Q. In connection with this particular study, have you prepared a table entitled, "Management Indexes for Electric Utilities; Classified by Size of Company; 1939"? A. Yes.

(Have Exhibit V-B-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (V-B-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. What were the sources of the data set forth thereon? A. The data were secured from the same sources as the data on Exhibit ..... (IV-B-1), which sources I have already described.

Q. Please describe Exhibit ..... for Identification (V-B-1). A. It is a table which classifies the 636 utility companies comprising my total sample into eight classifications according to the size of the company, the size being measured by total electric revenues for 1939. The smallest company size group consists of utilities having total electric revenues of less than $250,000 and the largest company size group consists of utilities having total electric revenues of

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over $20,000,000. In establishing the size classes I followed the same principles which I have previously stated in respect of the size classes utilized on Exhibit ..... (V-A-1). The table shows, as to the group of companies comprising each size class, for the year 1939, the average typical bills for, respectively, 25, 100 and 250 KWH of electricity. The table also classifies other groups of utilities, less than 636 in number, into the same eight company size groups, and shows, as to each such size group, the average executive expense per $1,000 of revenue, the average administrative and general expense per $1,000 of revenue, and the ratio between average administrative and general expense and total expenses. The table also classifies in the same eight size groups those holding company subsidiaries which employ mutual service companies for their management, and shows, as to each such size group, the average management fees per $1,000 of revenue and the ratio between such average management fees and total expenses.

(Here offer Exhibit ..... for Identification (V-B-1) in evidence.)

Q. Have you also broken down the data set forth on Exhibit ..... (V-B-1) as between independent utilities and holding company subsidiaries? A. Yes.

Q. To accomplish such breakdown have you prepared a table entitled "Management Indexes for Independent Electric Utilities; Classified by Size of Company; 1939," and a further table entitled, "Management Indexes for Subsidiary Electric Companies; Classified by Size of Company; 1939"? A. Yes.

(Have Exhibits V-B-2 and V-B-3 marked, respectively, Exhibits ..... and ..... for Identification.)

Q. Were Exhibits ..... (V-B-2) and ..... (V-B-3) for Identification prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. What are Exhibits ..... (V-B-2) and ..... (V-B-3) for Identification?, A. They are tables which are exactly in similar form to, and set forth the same type of data as are set forth in, Exhibit ..... (V-B-1), which I have already described, except that Exhibit ..... for Identification (V-B-2) is confined to independent utilities and Exhibit ..... for Identification (V-B-3) relates to holding company subsidiaries.

(Here offer Exhibits ..... (V-B-2) and ..... (V-B-3) for Identification in evidence.)

Q. In this same connection, have you also prepared a chart entitled, "Management Indexes of Independent and Subsidiary Utilities Subdivided by Size of Company—1939"? A. Yes.

(Have Chart V-B-4 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (V-B-4) prepared by you or under your supervision? A. Yes.

Q. Is the data set forth thereon accurate? A. It is.

Q. Please describe Exhibit ..... for Identification (V-B-4)? A. It is a chart which is designed to show graphically the data set forth on Exhibits ..... (V-B-1), and ..... (V-B-2) and ..... (V-B-3). The bars with diagonal lines represent the average typical electric bill data set forth in tabular form on the three other exhibits mentioned. The chart shows eight groups of bars which correspond with the eight company size classifications utilized on the tabular exhibits. There are two bars in each group, one representing the average bills of independent utilities, and the other representing the average bills of holding company subsidiaries, for 25, 100 and 250 KWH of electricity, respectively. It should be noted that these bars are of uniform width, thus indicating that the width of the bars as used in this chart is without significance.

The top pair of lines on the chart, one solid line and one crossed line, which run across the top of the field,

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connect the points which show the average administrative and general expense per $1,000 of revenue for independent utilities and holding company subsidiaries, respectively, as shown in the tabular exhibits already described. The pair of solid and crossed lines lower down on the chart connect the points which show the average executive expense per $1,000 of revenue for both the independent utilities and the holding company subsidiaries as shown in the tabular exhibits. The other line, drawn by dashes, connects the points which show average management fees per $1,000 of revenue for holding company subsidiaries only as shown in the tabular exhibit.

(Here offer Exhibit ..... for Identification (V-B-4) in evidence.)

Q. What does Exhibit ..... (V-B-1) indicate with respect to the relation of the size of an operating utility to the economy of management and operation thereof, as measured by average electric bills? A. The Exhibit practically speaks for itself. It indicates an unbroken relationship between the size of operating companies and the average charges for electricity. As the average size of operating company increases, the average electric bill decreases. It is true that the decreases in the average bills as between certain of the size classes are relatively small; but the fact is that the trend persists. The conclusion seems inescapable that economy of management and operation of utilities, as reflected in average electric bills, tends to improve as the size of operating company increases.

Q. Is the conclusion just stated in any way affected when the data set forth in Exhibit ..... (V-B-1) are broken down as between independent utilities and holding company subsidiaries? A. That conclusion is supported by such a breakdown. Reference to Exhibits ..... (V-B-2), ... (V-B-3) and ..... (V-B-4) shows that the relation between increasing size of operating company and decreasing amount of electric bills exists both in respect of the independents and the subsidiary companies. As far as the

subsidiaries are concerned, this relationship is completely consistent throughout all company size classes. A few slight interruptions appear in respect of the independent utilities. These interruptions of the trend are in nowise of such character as to negative the existence of the trend and no doubt result from the fact that the number of independent utilities in several of the size groups is so small as to preclude complete statistical reliability on some of the size group averages.

Q. What bearing do Exhibits ..... (V-B-2) and ..... (V-B-3) have on the relatively small decreases in the average electric bills as shown by the companies comprising the largest size class, that is the "over $20,000,000" class, on Exhibit ..... (V-B-1)? A. The bearing which these Exhibits have on the relatively small decreases in average electric bills in the largest size class as shown on Exhibit ..... (V-B-1) is similar to the bearing of Exhibits ..... and ..... (V-A-2 and V-A-3) on the apparent break in trend of decreasing electric bills with increasing size, shown in Exhibit ..... (V-A-1), although the data are compiled in a different manner and for a different purpose. The average bills of holding company subsidiaries in the two largest company size classes are very substantially lower than those of independent utilities in the same two size classes. In the next to largest size class, the $10,000,000 to $20,000,000 class, there is only one independent company as compared with 44 holding company subsidiaries whereas in the largest size class, the "over $20,000,000" class, there are 12 independent utilities as compared with 15 holding company subsidiaries. Accordingly, the relative influence of the independent utilities, from a statistical viewpoint, in the largest size class is much greater than in the next smaller size class. This increased statistical influence of the independent utilities, which have higher average bills than the subsidiary companies, in the largest size class, as compared with their almost negligible statistical influence in the next smaller size class, is, in my opinion, the reason for the small de-

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crease in the average bills of all electric companies in the largest size class as shown on Exhibit ..... (V-B-1).

Q. Now, Dr. Waterman, parenthetically and merely for the purpose of keeping the record clear, are Exhibits ..... (V-B-2) and ..... (V-B-3) the documents which you referred to earlier in your testimony and from which you took the data which are set forth on Exhibit ..... (IV-B-2) already in evidence? A. Yes.

Q. What does Exhibit ..... (V-B-1) show with respect to the relation of size of operating company to economy of management and operation of utilities, as measured by average executive expenses per $1,000 of revenue? A. There is a very consistent and definite decrease in the average executive expense per $1,000 of revenue as the size of operating company increases.

Q. Is the same downward trend of expense as the company size increases reflected when the average executive expense data set forth on Exhibit ..... (V-B-1) are broken down as between independent utilities and holding company subsidiaries? A. Yes. There are one or two departures from the trend when the average executive expense data are thus broken down, as shown by Exhibits ..... (V-B-2), and ..... (V-B-3), but such departures are not such as to deny the existence of the tendency and they are probably due to the small number of companies in the particular size classifications.

Q. What do these breakdown figures show with respect to the comparative performances of independent utilities and holding company subsidiaries, as measured by this particular index? A. In the first six company size classifications, the average executive expenses of the holding company subsidiaries are very much lower than those of the independent utilities. In the two largest company size groups the independents appear to have a slight advantage, but there are only 12 independent utilities in both those two size classifications combined. It may be noted in passing that the average executive expense of holding company subsidiaries in the smallest size class is only about one-third of that of the independent utilities in the same size class.

Q. What does Exhibit .....(V-B-1) indicate with respect to the relationship between size of operating company and economy of management and operation of utilities, as measured by average administrative and general expense per $1,000 of revenue? A. Here, again, increasing size of the operating company is accompanied by decreasing average administrative and general expense. The differences as between the several company size classes are not as marked as in the case of average executive expense but they progress in the same direction. The figures, as between the eight company size classifications, are not in every instance consistent, but the tendency is undoubted, and the lowest average figures appear in the case of the utilities in the largest company size group. I might point out that the fact that the average administrative and general expense for all utilities in the smallest company size class is lower than that in the next larger company size class should be considered in the light of Exhibits ..... (V-B-2) and ..... (V-B-3) which show that all five companies comprising the smallest company size class on Exhibit ..... (V-B-1) that is, the "under $250,000" class, are holding company subsidiaries. In any event, the data afford no basis for concluding that increases in the size of operating company are accompanied by decreasing economy in management and operation as measured by the cost of general management. Such evidence as there is points to the contrary.

Q. Is the same trend reflected when the data are broken down as between independent utilities and holding company subsidiaries? A. I would say yes, although reference to Exhibits ..... (V-B-2) and ..... (V-B-3) show there are some interruptions of the trend when the figures are so broken down. These interruptions may result statistically from the fact that there are so few companies in the several company size group samples here involved, particularly in the case of the independent utilities, as to give the average figures some element of statistical unreliability. It clearly appears, however, that the larger size independent utilities as well as the larger size holding company subsidiaries have average administrative and general expenses consid-

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erably below the average for all utilities. It also appears that the average administrative and general expense of both independents and subsidiary companies in the largest company size class is lower than in any other company size class.

Q. Diverting your attention momentarily from the relation of size of operating company to economy of management and operation and reverting to the question of the relationship between holding company control and economy of management and operation, I would like to ask you what these breakdown figures show with respect to the comparative economy of management and operation as between independent utilities and holding company subsidiaries as a whole? A. They show that uniformly the average administrative and general expense of holding company subsidiaries, in each of the eight company size classifications, is lower than that of the independent utilities.

Q. What does Exhibit ..... (V-B-1) indicate with respect to the relationship of size of operating company to economy of management and operation of utilities, as measured by average management fees per $1,000 of revenue? A. This index, of course, does not apply to independent utilities. It applies only to subsidiaries of holding companies which use service companies in their management. While this particular index is thus limited in scope, I believe it of some significance that the average management fees tend consistently to decrease as the size of the operating company increases. Reference to Exhibit ..... (V-B-1) shows that the average management fee remains about the same throughout the first three company size groups, drops for the next three size groups, and is still smaller for the two largest size groups.

Q. On the basis of Exhibits ..... (V-B-1), ... (V-B-2), ... (V-B-3) and ..... (V-B-4), what are your general conclusions as to the relationship between the factor of size of utilities and the economy of management and operation thereof? A. There is no evidence that increases in the size of operating companies are accompanied by sacrifice in economy of management and operation. In fact, the evi-

dence is to the contrary because certain costs show definite tendencies to decrease as company size increases. In any event, it is clear that there is no basis for concluding that economy in operation and management, whether measured by external or internal indexes, tends to increase as the size of the operating company increases.

I would like to state at this point that my conclusions are based not on performance of operating companies as measured by any single one of the indexes which I have described but rather on the overall consistent picture that is presented by a consideration of all the indexes.

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V-B-1
(II-B-1-2-3-4)

Exhibit .....

MANAGEMENT INDEXES FOR ELECTRIC UTILITIES; CLASSIFIED BY SIZE OF COMPANY; 1939

Total Electric Revenues of Operating Companies — Size Groups	1 — Average Typical Bills				2 — Av. Executive Expense per $1,000 Rev.		3 — Av. Adm. & Gen'l Expense per $1,000 Rev.		3 — Av. Adm. & Gen'l Expense as Per Cent of Total Expense		4 — Av. Mgt. Fees per $1,000 Revenue*		4 — Av. Mgt. Fees as Per Cent of Total Expense*	
	No. of Companies	25 KWH	100 KWH	250 KWH	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.
Under $250,000	208	$2.07	$5.28	$9.23	98	$41.86	5	$80.53	5	15.50%	52	$20.99	4	2.17%
250,001-500,000	64	1.96	4.95	8.65	50	21.13	54	83.96	54	17.20	27	21.62	26	4.02
500,001-1,000,000	80	1.79	4.74	8.47	60	17.66	62	83.34	61	16.44	34	20.76	34	4.27
1,000,001-3,000,000	101	1.78	4.64	8.22	74	12.78	76	73.18	74	16.40	45	11.30	44	2.64
3,000,001-5,000,000	54	1.65	4.50	8.03	36	11.10	39	68.98	39	16.10	20	11.46	20	2.48
5,000,001-10,000,000	57	1.61	4.34	7.83	43	9.83	43	71.26	42	18.04	34	9.11	33	2.53
10,000,001-20,000,000	45	1.41	3.96	7.21	33	9.32	33	72.29	33	17.69	24	6.74	23	1.82
Over $20,000,000	27	1.39	3.95	7.22	25	5.45	25	63.35	25	14.90	10	7.37	9	2.09
Total Companies	636	$1.82	$4.78	$8.46	419	$20.12	337	$75.31	333	16.71%	246	$14.89	193	2.95%
Per Cent of Sample by Sales		100	100	100	99		98		98		98		89	

*Includes only those companies operating under mutual service agreements.

Source of data: Federal Power Commission Reports.
Moody's Manual of Public Utilities, 1940.

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V-B-2
(II-B-1a-2a-3a)

Exhibit .....

MANAGEMENT INDEXES FOR INDEPENDENT ELECTRIC UTILITIES; CLASSIFIED BY SIZE OF COMPANY; 1939

Total Electric Revenues of Operating Companies — Size Groups	1a — No. of Companies	1a — Average Typical Bills 25 KWH	1a — 100 KWH	1a — 250 KWH	2a — Av. Executive Expense per $1,000 Rev. — No. of Companies	2a — Av.	3a — Av. Adm. and General Expense per $1,000 Rev. — No of Companies	3a — Av.	3a — Av. Adm. and General Expense as Per Cent of Total Expense — No of Companies	3a — Av.
Under $250,000	94	$2.09	$5.32	$9.23	43	$66.43	....	....	....	....
250,001-500,000	22	2.01	4.97	8.56	12	33.86	14	$ 92.49	14	21.01%
500,001-1,000,000	16	1.81	4.73	8.42	9	26.71	11	108.24	10	21.57
1,000,001-3,000,000	21	1.95	4.87	8.65	13	17.65	14	78.84	14	19.83
3,000,001-5,000,000	11	1.71	4.88	8.47	7	13.03	9	85.57	9	20.93
5,000,001-10,000,000	5	1.83	4.58	8.27	5	22.54	5	75.86	5	17.90
10,000,001-20,000,000	1	1.69	5.11	8.57	1	5.66	1	83.08	1	15.30
Over $20,000,000	12	1.45	4.10	7.44	11	5.24	11	68.84	11	15.84
Total Companies	182	$1.96	$5.05	$8.82	101	$39.60	65	$ 85.83	64	20.24%
Per Cent of Sample by Sales		100	100	100	98		99		99	

Source of data: Federal Power Commission Reports.
Moody's Manual of Public Utilities, 1940.

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V-B-3
Exhibit (II-B-1b-2b-3b-4b)

Exhibit .....

MANAGEMENT INDEXES FOR SUBSIDIARY ELECTRIC COMPANIES; CLASSIFIED BY SIZE OF COMPANY; 1939

Total Electric Revenues of Operating Companies — Size Groups	1b — Average Typical Bills — No. of Companies	25 KWH	100 KWH	250 KWH	2b — Av. Executive Expense per $1,000 Rev. — No. of Companies	Av.	3b — Av. Adm. & Gen'l Expense per $1,000 Rev. — No. of Companies	Av.	3b — Av. Adm. & Gen'l Expense as Per Cent of Total Expense — No. of Companies	Av.	4b — Av. Mgt. Fees per $1,000 Revenue* — No. of Companies	Av.	4b — Av. Mgt. Fees as Per Cent of Total Expense* — No. of Companies	Av.
Under $250,000	114	$2.05	$5.25	$9.23	55	$22.66	5	$80.53	5	15.50%	52	$20.99	4	2.17%
250,001-500,000	42	1.93	4.94	8.70	38	17.11	40	80.97	40	15.87	27	21.62	26	4.02
500,001-1,000,000	64	1.78	4.74	8.48	51	16.07	51	77.97	51	15.43	34	20.76	34	4.27
1,000,001-3,000,000	80	1.74	4.58	8.10	61	11.74	62	71.90	60	15.60	45	11.30	44	2.64
3,000,001-5,000,000	43	1.63	4.41	7.91	29	10.63	30	64.00	30	14.65	20	11.46	20	2.48
5,000,001-10,000,000	52	1.59	4.32	7.78	38	8.16	38	70.66	37	18.06	34	9.11	33	2.53
10,000,001-20,000,000	44	1.40	3.94	7.18	32	9.44	32	71.96	32	17.76	24	6.74	23	1.82
Over $20,000,000	15	1.35	3.83	7.05	14	5.63	14	58.33	14	14.17	10	7.37	9	2.09
Total Companies	454	$1.77	$4.67	$8.32	318	$13.93	272	$72.80	269	16.02%	246	$14.89	193	2.95%
Per Cent of Sample by Sales		100	100	100	98		98		97		98		89	

* Applies only to those companies operating under mutual service agreements.
Source of data: Federal Power Commission Reports.
Moody's Manual of Public Utilities, 1940.

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Q. Will you now describe the third section of your second major group of studies, namely, that designed to show the relationship between the size of utilities and the soundness of their financial policies and administration? A. This particular section of the studies seeks to determine what relationship, if any, the factor of size of operating company bears to each of the several ratios of income administration which I utilized in the prior study to determine the relationship of character of control over utilities to the soundness of the financial management thereof. I have already explained these ratios and stated why they were selected.

Q. In your study designed to show the relationship of the factor of holding company control to the soundness of financial management you considered not only these so-called ratios of "income administration" to which you have just referred but also costs of bond money and preferred stock money and costs of raising such funds. Did you make any effort to determine the relationship of size of operating company to soundness of financial management by measuring relative costs of bond and preferred stock money and the relative costs of raising the same as between groups of utilities of different sizes? A. Such efforts would have been statistically in vain. It will be recalled that the data on which those particular studies were made were limited. Therefore it would have been impossible to break down the data as to money costs still further, that is, as between groups of operating companies of different sizes, and still have any samples which would possess statistical significance.

Q. Do you know of any studies that have been made pertaining to the relationship between costs of capital and size of issuing companies? A. There are available some studies prepared by the Securities and Exchange Commission which deal with such costs as related to size of security issues and in some instances to size of issuing companies. These studies throw an indirect light on the question which I was unable to answer directly from the data at my disposal.

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Q. Will you indicate the nature of these studies by the Securities and Exchange Commission and the conclusions therefrom? A. Reports of the Securities and Exchange Commission's Research and Statistics Section of its Trading and Exchange Division for the years 1938-39 indicate a definite relationship between cost of flotation and size of issuer for all types of companies, with proportional costs declining as size of company increased. Underwritten bonds in 1939 showed a drop in total cost from 7.3 per cent for four issues of companies in the under $1,000,000 size group (measured by total assets) to 6.4 per cent for nine issues of companies in the $1,000,000 to $5,000,000 group and to 3.1 per cent for four issues of companies in the $5,000,000 to $10,000,000 group. Both bankers' compensation and expenses of issue shared in this sharp decline. For the larger issuer size groups the reduction was more gradual. Total cost amounted to 2.3 per cent for eleven bonds in the largest size group ($200,000,000 and over), with expenses showing the greatest proportional decline.

Q. Did this phenomenon apply just to bonds or to other types of securities likewise? A. Chart 7 on page 24 of the Research and Statistics Section's publication of March, 1941, entitled "Cost of Flotation for Registered Securities 1938-39" shows an even greater tendency for costs to decline as size of issuer increased in the case of preferred stocks than in the case of bonds in 1939. Costs of flotation for common stock in 1939 paralleled the cost record for preferred stock although at a higher level. These phenomena were confirmed by the conclusions contained in the Securities and Exchange Commission's Statistical Release #572, dated June 6, 1941, which called attention to the 1940 record. For that year costs for underwritten bond issues offered to the public declined consistently from 5.5 per cent for issues of companies with assets of from $1,000,000 to $5,000,000 to 2.1 per cent for issues of companies with assets of $200,000,000 or over. For underwritten preferred stock issues, a consistent decline from 15.5 per cent for issues of companies with assets of less than $1,000,000 to 3.4 per cent for issues of companies with assets of

$100,000,000 to $200,000,000 was indicated. For underwritten common stock the same tendency was evidenced.

Q. You say these data apply to all companies whose securities have been registered with the Securities and Exchange Commission. Is there any indication that they apply with the same results to the securities of public utility companies? A. Obviously there would be an insufficient number of cases from which to draw conclusions regarding common stock issues of utilities, however, Chart 8 on page 27 of "Cost of Flotation for Registered Securities 1938-39" and table 7 on Appendix page 25 of Statistical Release No. 572 show for the years 1939 and 1940, respectively, that for Electric Light and Power, Gas, and Water Companies the costs of flotation decreased as the size of *issues* increased. It is reasonable to expect that there would be at least some relationship between size of issues and size of issuers. Certainly the same characteristics of flotation costs which permit the phenomenon of decreasing costs would pertain equally well to industrial concerns and utility businesses.

Q. In view of all of this data what is your own conclusion regarding the relationship between size of operating company and the costs of raising capital? A. It is my considered opinion that with respect to bonds and preferred stocks the costs of raising bond and preferred stock money should and do decrease as the size of issuing company increases. Small utilities can sell nothing but small issues, so the facts in the Securities and Exchange Commission's reports regarding the high cost of small issues are definitely applicable to such small utilities. Large utilities alone have the opportunity of fitting their issues to the market from a size standpoint and they alone can spread the expenses of issue over a sizable block of bonds of preferred stocks. There is undoubtedly some limit to these size economies but there is no statistical basis for establishing that limit.

Q. Have you any opinion regarding the existence of a relationship between size of utility operating company and the per annum cost of utility capital on a yield basis? A.

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Of course the factors which have just been discussed regarding costs of flotation will tend to lower per annum costs of money by increasing net proceeds to issuers as the size of issuer increases. Furthermore, I am satisfied that there is at least a tendency for the bond market to express its preference for bonds of large issuers and to express that preference in terms of higher prices, and thus lower yields, as the size of issuer increases.

Q. What is the basis for such an opinion? A. Partly on the basis of the reasoning that large utilities in general tend to have somewhat less business risk because of their diversity of load and their lower average electric rates as already referred to, and partly for the reason that large issues of large companies are more acceptable to investors because of their greater marketability. This reasoning was recently confirmed for me by two of my graduate students who conducted an empirical study of twenty-four outstanding operating utility bond issues. Their study demonstrated by correlation methods that, over and above interest coverage factors which dominated the bond yields, there were variations in the yields closely associated with the size of issuer in such a way as to establish an inverse correlation between the yield and the size of issuer.

Q. As part of the present study, have you prepared three tables, being (1) a table entitled, "Income Administration Ratios of Independent and Subsidiary Utilities; Classified According to Size of Company, 1939", (2) a table entitled, "Income Administration Ratios of Independent Utilities, Classified According to Size of Company, 1939", and (3) a table entitled, "Income Administration Ratios of Subsidiary Companies; Classified According to Size of Company, 1939"? A. Yes.

(Have Exhibits V-C-1, V-C-2, and V-C-3 marked, respectively, Exhibits ....., ... and ..... for Identification.)

Q. Were Exhibits ....., ... and ..... for Identification prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Have you previously described the source of the data appearing on these exhibits? A. Yes. The data were secured from the same sources as those set forth in Exhibit ..... (IV-C-5), which sources I have already described.

Q. Please describe Exhibit ..... for Identification (V-C-1). A. It will be recalled that the study dealing with the relationship between holding company control over utilities and the soundness of their financial management was predicated upon a statistical sample of 288 utilities in respect of which the financial data in question were available. Exhibit ..... for Identification (V-C-1) is a table which classifies said 288 companies into eight size of company classifications, the size being measured by total gross revenues of the operating companies. The same eight size of company classifications are used as in previous exhibits. The table shows, as to the group of companies comprising each size class, for the year 1939, the following ratios: (1) the ratio of common stock earnings to income, (2) the ratio of common stock dividends to common stock earnings, (3) the ratio of interest plus preferred stock dividends to income, (4) the ratio of common stock dividends to income, (5) the ratio of earnings spent for all capital to income, (6) the ratio of earnings retained in the business to common stock earnings, and (7) the ratio of earnings retained in the business to income.

Q. What are Exhibits ..... (V-C-2) and ..... (V-C-3) for Identification? A. They are identical in form with Exhibit ..... for Identification (V-C-1) and are merely breakdowns of the data set forth on said Exhibit. Exhibit ..... for Identification (V-C-2) deals solely with independent utilities and Exhibit ..... for Identification (V-C-3) deals solely with holding company subsidiaries.

(Here offer Exhibits ..... (V-C-1), ... (V-C-2), and ..... (V-C-3) for Identification in evidence)

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Q. What does Exhibit ..... (V-C-1) indicate with respect to the relationship of size of operating company to the soundness of financial management as measured by the indexes which you have employed? A. There does not appear to be any well defined statistical pattern running through any of the ratios set forth on Exhibit ..... (V-C-1). The averages move up and down quite indiscriminately throughout the several company size groupings. There is apparently a very slight tendency for companies of smaller size, on the average, to have relatively lower fixed charges than some of the larger companies, but this may be due to the difficulty that small companies have in floating bond issues on reasonable terms, since the very largest companies, those with annual gross revenues of over $20,000,000, have lower average fixed charges proportionately than the companies in any of the four next smaller size classes.

Since the portion of income distributed to the common stockholders tends to vary inversely with the portion distributed to the bondholders and preferred stockholders, the result is a certain degree of similarity in the averages of total "earnings spent for all capital" regardless of the size of operating company. In this respect Exhibit ..... (V-C-1) suggests, though in no pronounced manner, that the smaller companies tend to reinvest a somewhat larger portion of earnings than do the larger companies, but the averages for the several size classes are rather erratic relative to each other—thus showing no clear-cut relationship between size of company and distribution of income. On the whole I can detect no really significant relationship between size of the operating company and any of the ratios which I have selected to test soundness of financial management.

Q. Is your conclusion affected when the data on Exhibit ..... (V-C-1) are broken down so that the performance of independent utilities and of holding company subsidiaries can be examined separately? A. I do not believe so. Reference to Exhibit ..... (V-C-2) shows that the independent utilities for which the particular data in question are available are too few in number to reveal typical situations or

to afford an element of statistical reliability to the average figures. Reference to Exhibit ..... (V-C-3) indicates that the larger holding company subsidiaries average somewhat heavier distributions of residual profit (see column b), pay out more in interest and preferred dividends (see column c), and retain smaller average amounts of profit (see column g) than do smaller holding company subsidiaries. Said Exhibit thus provides some evidence that large holding company subsidiaries tend to spend more of their profits for returns on capital than do smaller ones. In view, however, of the known fact that the larger holding company subsidiaries, such as those having annual revenues in excess of $5,000,000, find a more ready acceptance of their own securities in the capital market than do smaller subsidiaries, there is perhaps less need on the part of the larger subsidiaries to reinvest so large a part of their earnings. That the particular situation under discussion exists arises chiefly from the fact that holding companies tend to take somewhat more of their common stock profit from their large subsidiaries than from their small ones. In this connection, however, it should be recalled, as shown by Exhibit ..... (IV-C-5), that the average common stock dividends paid by all holding company subsidiaries is a considerably smaller proportion of residual earnings than the average common stock dividends paid by independent utilities.

Q. Looking at Exhibits ..... (V-C-1), ... (V-C-2) and ..... (V-C-3) together, what are your conclusions generally with respect to the effect of size of operating company upon soundness of financial management? A. Upon all the bases of comparison which adapt themselves to statistical treatment, I do not believe that there are any really significant over-all differences between large size companies and small size companies on the score of sound and efficient financial management. To state my conclusion somewhat more specifically, it is my opinion that the factor of size of operating company in and of itself has no real or direct relationship to sound and efficient financial management.

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V-C-1
(III-B-2)

Exhibit .....

INCOME ADMINISTRATION RATIOS OF INDEPENDENT AND SUBSIDIARY UTILITIES; CLASSIFIED ACCORDING TO SIZE OF COMPANY, 1939

Total Gross Revenues of Operating Company	Number of Companies	a Common Stock Earnings as Per Cent of Income	b Common Dividends as Per Cent of Common Stock Earnings*	c (100 — a) Interest Plus Preferred Dividends as Per Cent of Income	d Common Stock Dividends as Per Cent of Income	e (c + d) Earnings Spent for All Capital as Per Cent of Income	f (100 — b) Earnings Retained as Per Cent of Common Stock Earnings*	g (100 — e) Earnings Retained as Per Cent of Income
Averages								
Less than $250,000	16	60.8	61.8	39.2	42.5	81.7	38.2	18.3
$250,000 to $500,000	17	48.8	60.5	51.2	34.3	85.5	39.5	14.5
$500,001 to $1,000,000	35	55.8	58.3	44.2	41.1	85.3	41.7	14.7
$1,000,001 to $3,000,000	69	39.4	50.0	60.6	28.2	88.8	50.0	11.2
$3,000,001 to $5,000,000	36	44.6	54.9	55.4	32.9	88.3	45.1	11.7
$5,000,001 to $10,000,000	49	39.4	58.7	60.6	29.1	89.7	41.3	10.3
$10,000,001 to $20,000,000	35	36.8	57.0	63.2	25.4	88.6	43.0	11.4
Over $20,000,000	31	48.5	73.1	51.5	39.2	90.7	26.9	9.3
Total Companies	288	44.4	57.9	55.6	32.5	88.1	42.1	11.9

* Average computed excluding 22 companies neither earning nor paying common stock dividends; 10 independents and 12 subsidiaries.
Source of data: Moody's Manual of Public Utilities, 1940.

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V-C-2
(III-B-2x)

Exhibit .....

INCOME ADMINISTRATION RATIOS OF INDEPENDENT UTILITIES; CLASSIFIED ACCORDING TO SIZE OF COMPANY

Total Gross Revenues of Operating Company	Number of Companies	a Common Stock Earnings as Per Cent of Income	b Common Dividends as Per Cent of Common Stock Earnings*	c (100 — a) Interest Plus Preferred Dividends as Per Cent of Income	d Common Stock Dividends as Per Cent of Income	e (c + d) Earnings Spent for All Capital as Per Cent of Income	f (100 — b) Earnings Retained as Per Cent of Common Stock Earnings*	g (100 — e) Earnings Retained as Per Cent of Income
Less than $250,000	9	56.5	70.9	43.5	41.2	84.7	29.1	15.3
$250,000 to $500,000	8	38.7	65.9	61.3	28.2	89.5	34.1	10.5
$500,001 to $1,000,000	11	56.5	59.4	43.5	34.6	78.1	40.6	21.9
$1,000,001 to $3,000,000	9	39.4	77.2	60.6	32.3	92.9	22.8	7.1
$3,000,001 to $5,000,000	9	54.7	73.2	45.3	46.1	91.4	26.8	8.6
$5,000,001 to $10,000,000	6	48.3	67.4	51.7	42.7	94.4	32.6	5.6
$10,000,001 to $20,000,000	4	31.1	32.7	68.9	9.7	78.6	67.3	21.4
Over $20,000,000	11	62.3	83.4	37.7	52.7	90.4	16.6	9.6
Total Companies	67	50.5	69.2	49.5	38.2	87.7	30.8	12.3

* Average computed excluding 10 companies neither earning nor paying common stock dividends.
Source of data: Moody's Manual of Public Utilities, 1940.

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V-C-3
(III-B-2y)

Exhibit .....

INCOME ADMINISTRATION RATIOS OF SUBSIDIARY UTILITIES; CLASSIFIED ACCORDING TO SIZE OF COMPANY, 1939

Total Gross Revenues of Operating Company	Number of Companies	Common Stock Earnings as Per Cent of Income	Common Dividends as Per Cent of Common Stock Earnings*	Interest Plus Preferred Dividends as Per Cent of Income	Common Stock Dividends as Per Cent of Income	Earnings Spent for All Capital as Per Cent of Income	Earnings Retained as Per Cent of Common Stock Earnings*	Earnings Retained as Per Cent of Income
Averages		a	b	c (100 — a)	d	e (c + d)	f (100 — b)	g (100 — e)
Less than $250,000	7	66.4	52.8	33.6	44.2	77.8	47.2	22.2
$250,000 to $500,000	9	57.8	56.3	42.2	39.7	81.9	43.7	18.1
$500,001 to $1,000,000	24	55.4	57.8	44.6	44.1	88.7	42.2	11.3
$1,000,001 to $3,000,000	60	39.4	46.9	60.6	27.6	88.2	53.1	11.8
$3,000,001 to $5,000,000	27	41.2	49.3	58.8	28.5	87.3	50.7	12.7
$5,000,001 to $10,000,000	43	38.1	57.9	61.9	27.2	89.1	42.1	10.9
$10,000,001 to $20,000,000	31	37.5	59.4	62.5	27.4	89.9	40.6	10.1
Over $20,000,000	20	40.8	67.4	59.2	31.7	90.9	32.6	9.1
Total Companies	221	42.6	54.9	57.4	30.8	88.2	45.1	11.8

* Average computed excluding 12 companies neither earning nor paying common stock dividends.
Source of data: Moody's Manual of Public Utilities, 1940.

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Q. Please describe the fourth section in your second major group of studies, namely, that designed to determine the relationship between the size of utilities and protection of investors in utilities? A. This particular section of the studies seeks to determine what relationship, if any, the factor of size of operating company bears to each of the several indexes or measures which I employed in my study seeking to determine the relationship between the character of control over utilities and the protection of investors. I have already explained these several indexes or measures of investor protection and stated the reasons why they were selected.

Q. Have you prepared a table entitled, "Investor Protection Ratios for Independent and Subsidiary Utilities Classified According to Size of Company, 1939"? A. Yes.

(Have Exhibit V-D-1) marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (V-D-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Where were the data set forth in this Exhibit secured? A. From the same sources as the data set forth on Exhibit ..... (IV-D-1), which sources have already been described.

Q. Please describe Exhibit ..... for Identification (V-D-1). A. It is a table which classifies the same utility companies which compose the sample by which I have sought to test the relationship between character of control over utilities and the protection of investors therein into eight classifications according to size of the company, size of company being measured, as in previous financial exhibits, by total operating revenues. The table shows, as to the group of utilities comprising each of the eight company size classes, for the year 1939, (1) the average number of times bond interest has been earned, (2) the average percentage of gross revenue remaining after payment of bond interest, (3) the average number of times bond

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interest plus preferred stock dividends have been earned, (4) the average percentage of gross revenue remaining after payment of preferred stock dividends, and (5) the average ratio of common stock earnings to income.

(Here offer Exhibit ..... for Identification (V-D-1) in evidence.)

Q. Have you undertaken to break down the data set forth on Exhibit ..... (V-D-1) as between independent utilities and holding company subsidiaries? A. Yes.

Q. To that end, have you prepared a table entitled, "Investment Protection Ratios for Independent Utilities Classified According to Size of Company, 1939", and a further table entitled "Investor Protection Ratios of Subsidiary Utilities Classified According to Size of Company, 1939"? A. Yes.

(Have Exhibit V-D-2 and Exhibit V-D-3 marked, respectively, as Exhibits ..... and ..... for Identification.)

Q. Were Exhibits ..... (V-D-2) and ..... (V-D-3) for Identification prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibits ..... (V-D-2) and ..... (V-D-3) for Identification. A. They are tables of exactly the same character, and set forth data of the same character, as in Exhibit ..... (V-D-1), except that the former is confined to independent utilities and the latter to holding company subsidiaries.

(Here offer Exhibits ..... (V-D-2) and ..... (V-D-3) for Indentification in evidence.)

Q. What does Exhibit ..... (V-D-1) indicate with respect to the relationship between the size of operating company and protection to investors in utilities as measured by the indexes which you have employed? A. It demon-

strates that there is no relationship between size of operating company and protection to investors in operating utilities. The various index averages follow no definite or discernible statistical pattern in relation to increases or decreases in the size of operating company. At first glance, Exhibit ..... (V-D-1) may seem to show a very slight tendency for the "times interest earned" ratio to decrease as the size of operating company increases but the trend is too erratic to possess any significance, and, moreover, it is not accompanied by a similar trend in the average percentages of gross revenue remaining after payment of bond interest charges. On the contrary, the average percentage of gross revenue remaining after payment of bond interest seems to show a tendency to increase slightly with the increase in size of operating company, thus indicating a greater margin of investor safety for the holders of bonds of the larger size companies. The Exhibit indicates that the utilities in the very smallest company size group, that is, the group with total gross revenues of less than $250,000, and the companies in the group having total gross revenues between $500,000 to $1,000,000, have very high interest coverage averages. That this phenomenon is probably due to the difficulty with which small companies float bond issues at reasonable rates is indicated by the fact that the utilities in the same two company size groups show average percentages of gross revenue remaining after bond interest charges below the average for all utilities,—a situation which may occur when companies have small amounts of debt and low gross revenues.

Similarly, no relationship can be discerned between overall preferred stock dividend coverages and size of operating company. As far as the average precentage of revenue remaining after payment of preferred stock dividends is concerned, the only trend, if any exists, is for this percentage to increase with the increase in the size of operating company. Likewise, the element of administrable operating profits shows no more than random distribution. On the whole, it must be concluded that the differences in the various averages as between the several company size

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groups might have been equally as diverse if the companies comprising the several groups had been drawn out of a hat instead of carefully classified on the basis of size; or, to state it differently, that there is no evidence that mere size of the operating company is a factor which in and of itself is related to either the protection of bondholders or the protection of preferred stockholders of operating utilities.

Q. Are your conclusions in any way affected by a consideration of the breakdown of the figures shown on Exhibit ..... (V-D-1) as between independent utilities and holding company subsidiaries? A. No. When the indexes in question are examined for independent utilities and holding company subsidiaries separately, the data lose considerable statistical stability because of the decrease in the number of companies making up the several size groups. This is particularly true as to Exhibit ..... (V-D-2), which is the table dealing with independent utilities. Subject to that qualification, however, the average figures set forth on Exhibits ..... (V-D-2) and ..... (V-D-3) show no more of a statistical pattern or trend as between the several company size groups with respect to either the independent utilities or the holding company subsidiaries examined separately than appears in the case of both types of utilities grouped together.

Q. Looking at all your studies relating to the relationship of size of operating company to protection to investors, what is your general conclusion? A. In my opinion, mere increase in the size of the operating company in and of itself does not tend to affect adversely the kind or quality of investment protection afforded to bondholders or preferred stockholders of such operating company.

Q. Now, departing momentarily from the precise subject under discussion, and reverting to one of the subjects of your first major group of studies, will you please state what Exhibits ..... (V-D-2) and ..... (V-D-3) indicate with respect to the relative protection accorded to investors as between independent utilities and holding company subsidiaries? A. In this respect said Exhibits serve only to emphasize the conclusions previously stated to the effect

that independent utilities tend to show a higher coverage of fixed charges but that gross revenue balances remaining after preferred dividends are, if anything, somewhat greater for the holding company subsidiaries. Of course it should be emphasized that this is a statistical conclusion based on averages. The basis forbids that the conclusion be applied to consideration of securities of individual companies since the use of averages brings in a diversity of companies within each size group; therefore the conclusion is applicable only to the entire field.

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Exhibit .....

V-D-1
(IV-B-1, 2, 3)

INVESTOR PROTECTION RATIOS FOR INDEPENDENT AND SUBSIDIARY UTILITIES CLASSIFIED ACCORDING TO SIZE OF COMPANY, 1939

Total Gross Revenues of Operating Company	1 Bond Protection			2 Preferred Stock Protection			3 Balance of Income	
	Number of Companies	Average Times Interest Earned	Average Per Cent Revenue Remaining after Interest	Number of Companies	Average Times Dividends and Interest Earned	Average Per Cent Revenue Remaining after Preferred Dividends	Number of Companies	Average Common Stock Earnings as Per Cent of Income
Less than $250,000	13	8.5	16.0%	5	1.1	5.2%	16	60.8%
$250,000 to $500,000	15	3.0	16.3	8	1.3	7.9	17	48.8
$500,001 to $1,000,000	32	9.1	14.0	14	2.5	8.5	35	55.8
$1,000,001 to $3,000,000	64	4.4	13.6	47	1.4	7.5	69	39.4
$3,000,001 to $5,000,000	33	5.1	17.1	27	2.4	10.3	36	44.6
$5,000,001 to $10,000,000	47	4.0	17.8	40	1.6	9.9	49	39.4
$10,000,001 to $20,000,000	35	2.6	18.1	30	1.7	11.5	35	36.8
Over $20,000,000	31	3.1	19.7	26	2.1	14.5	31	48.5
Total Companies	270	4.7	16.4%	197	1.8	9.9%	288	44.4%

Source of data: Moody's Manual of Public Utilities, 1940.

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V-D-2
(IV-B-1a, 2a, 3a)

Exhibit .....

INVESTMENT PROTECTION RATIOS FOR INDEPENDENT UTILITIES CLASSIFIED ACCORDING TO SIZE OF COMPANY, 1939

Total Gross Revenues of Operating Company	1a Bond Protection			2a Preferred Stock Protection			3a Balance of Income	
	Number of Companies	Average Times Interest Earned	Average Per Cent Revenue Remaining after Interest	Number of Companies	Average Times Dividends and Interest Earned	Average Per Cent Revenue Remaining after Preferred Dividends	Number of Companies	Average Common Stock Earnings as Per Cent of Income
Less than $250,000	6	11.2	14.6%	4	1.0	4.5%	9	56.5%
$250,000 to $500,000	8	3.3	15.7	5	1.2	4.7	8	38.7
$500,001 to $1,000,000	10	12.3	15.6	5	4.1	11.7	11	56.5
$1,000,001 to $3,000,000	8	9.0	15.1	6	1.3	8.0	9	39.4
$3,000,001 to $5,000,000	7	3.0	16.8	4	6.1	14.2	9	54.7
$5,000,001 to $10,000,000	6	14.6	20.2	3	0.9	0.5	6	48.3
$10,000,001 to $20,000,000	4	2.2	10.9	2	1.1	3.6	4	31.1
Over $20,000,000	11	3.7	19.9	7	2.8	16.9	11	62.3
Total Companies	60	7.4	16.5%	36	2.4	9.2%	67	50.5%

Source of data: Moody's Manual of Public Utilities, 1940.

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Exhibit .....

V-D-3
(IV-B-1b, 2b, 3b)

INVESTOR PROTECTION RATIOS OF SUBSIDIARY UTILITIES CLASSIFIED ACCORDING TO SIZE OF COMPANY, 1939

Total Gross Revenues of Operating Company	1b Bond Protection: Number of Companies	1b Bond Protection: Average Times Interest Earned	1b Bond Protection: Average Per Cent Revenue Remaining after Interest	2b Preferred Stock Protection: Number of Companies	2b Preferred Stock Protection: Average Times Dividends and Interest Earned	2b Preferred Stock Protection: Average Per Cent Revenue Remaining after Preferred Dividends	3b Balance of Income: Number of Companies	3b Balance of Income: Average Common Stock Earnings as Per Cent of Income
Less than $250,000	7	6.2	17.2%	1	1.3	8.2%	7	66.4%
$250,000 to $500,000	7	2.7	17.0	3	1.6	13.3	9	57.8
$500,001 to $1,000,000	22	7.7	13.3	9	1.6	6.7	24	55.4
$1,000,001 to $3,000,000	56	3.8	13.4	41	1.5	7.4	60	39.4
$3,000,001 to $5,000,000	26	5.7	17.1	23	1.7	9.6	27	41.2
$5,000,001 to $10,000,000	41	2.5	17.4	37	1.6	10.7	43	38.1
$10,000,001 to $20,000,000	31	2.7	19.0	28	1.8	12.1	31	37.5
Over $20,000,000	20	2.8	19.7	19	1.9	13.7	20	40.8
Total Companies	210	4.0	16.3%	161	1.7	10.1%	221	42.6%

Source of data: Moody's Manual of Public Utilities, 1940.

Q. Having discussed the relation of holding company control and size of operating company to the objectives of the Act, I now direct your attention to the third major group of your studies, namely, those designed to determine the relationship between the size of holding company system and the statutory objectives. As a background for your discussion thereof, will you briefly restate the scope of this third group of studies? A. In conformity with the general outline stated at the outset of my testimony, this group of studies seeks to determine what relationship, if any, exists between the size of holding company system and the statutory purposes, as measured by (1) the cost of electric service to consumers, (2) economy in management and operation of utilities, (3) soundness of financial management of utilities, and (4) the protection of investors in securities of operating utilities.

Q. Is there any feature of this third group of studies which differentiates it from the first two groups? A. Yes, there is one obvious distinction which must be noted. The studies testing the relationship of holding company control to the objectives of the Act necessarily involve comparisons between the performance of independent utilities and that of holding company subsidiaries. The studies testing the relationship of size of company to the statutory objectives do not necessarily require, but do permit of such comparisons. This third group of studies, by definition, are necessarily confined to holding company subsidiaries.

Q. In connection with your study to test the effect of size of holding company system upon the cost of rendering electric service, have you prepared a table entitled, "Average Typical Electric Bills Charged by Subsidiary Utilities; Classified by Size of Holding Company System, as of January 1, 1940"? A. Yes.

(Have Exhibit VI-A-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VI-A-1) prepared by you or under your supervision? A. Yes.

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Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Does it show on its face the source of the data set forth thereon? A. Yes.

Q. Please describe Exhibit ..... for Identification (VI-A-1). A. It is a table which classifies the 44 holding company systems which we are using as the basis of our studies into several classifications according to size, size being measured by total operating revenues of the respective systems. The smallest holding company system size classification consists of holding company systems whose total gross revenues are under $2,000,000 a year; the largest size classification consists of holding companies whose gross revenues are over $160,000,000. The various size groupings were selected in accordance with principles heretofore stated in connection with other exhibits. The table shows, in respect of the group of holding company systems in each size classification, or, more accurately in respect of the group of holding company subsidiaries in each holding company system size classification, for the year 1939, the weighted average typical electric bills for 25, 100 and 250 KWH of electricity, respectively. These average bills have been weighted according to the population served as previously explained. The table also shows, in respect of the companies in each holding company system size classification, the number and percentage of the total population served, the dollar amounts of sales of electricity to ultimate consumers, the percentage of sales for each group, the number of operating companies covered by each size grouping, the average population served per operating company, and the average dollar amounts of sales of electricity both per capita of population served and per operating company in each holding company size group.

(Here offer Exhibit ..... for Identification (VI-A-1) in evidence.)

Q. As part of the same study, have you also prepared a chart entitled, "Weighted Average Typical Electric Bills

of Subsidiary Companies Classified by Size of Holding Company System—January 1, 1940"? A. Yes.

(Have Chart VI-A-2 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VI-A-2) prepared by you or under your supervision? A. Yes.

Q. Do you believe the same to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification, (VI-A-2). A. It is a chart which is designed to represent graphically the data set forth on Exhibit ..... (VI-A-1). In light of my explanation of that Exhibit and the legends at the bottom of the chart, I believe the latter should be almost self-explanatory. The bars with the diagonal lines on the chart are replicas of the average electric bill data contained in tabular form on Exhibit ..... (VI-A-1). There are eight bars which correspond with the eight holding company size classifications which I have mentioned. The percentage figure under each bar indicates the percentage of total sales of electricity by all holding company subsidiaries to ultimate consumers represented by the holding company systems in the particular size group represented by such bar. Each bar thus indicates the relative significance of the holding company subsidiaries in that particular size group to all holding company subsidiaries. The bars are drawn to logarithmic scale vertically and to natural scale horizontally as in the case of Exhibit ..... (V-A-4). This is another situation where the differences in the dollar amounts of sales of electricity by the companies in the several size groups can best be shown visually by a natural scale whereas the significant differences in average typical electric bills of the companies in the several size groups can be better portrayed graphically by use of a percentage or ratio scale.

(Here offer Exhibit ..... for Identification (VI-A-2) in evidence.)

Q. What do Exhibits ..... (VI-A-1) and ..... (VI-A-2) indicate with respect to the relationship between the size

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of holding company systems and the cost of electric service to residential consumers served by the operating companies making up such systems? A. They indicate that there is no consistent relationship between mere size of the holding company system as such and the cost of electric service to consumers. While it appears from the exhibits that the highest average electric bills are paid by the consumers served by the smallest size holding company systems and that the lowest average electric bills are paid by consumers served by the largest size holding company systems, the decrease in bills is not steadily correlated with size of holding company system as the latter increases. However, it is true that the only consumers enjoying average electric bills which are lower at all three use levels than the average bills of all holding company systems are those which are served by subsidiaries of large holding company systems, namely, those in the class having total gross revenues from $80,000,000 to $120,000,000 and those in the class having total gross revenues of over $160,000,000. In passing, it may be pointed out that the subsidiary companies in these two groups of large-sized holding company systems serve 44% of the population which is served by all holding company subsidiaries and represent 44% of the total sales to ultimate consumers of all holding company subsidiaries.

Nevertheless, while the companies in the very largest holding company systems show the smallest average electric bills and the companies in the very smallest holding company systems show the highest average electric bills, looking at operating companies in the systems in-between the largest and the smallest size groups, there does not appear to be any well defined statistical relationship between what consumers pay for electricity and the size of the holding company system serving them. As to such in-between size groups, the amounts of the average electric bills move up and down quite indiscriminately.

Q. Have you any opinion as to the reason for the lack of a consistent correlation between average electric bills and size of holding company system? A. In my opinion, a significant reason for the ups and downs in the electric

bill averages as between the several size groups lies in the fact that in Exhibit ..... (VI-A-1), as supplemented by Exhibit ..... (VI-A-2), for the first time, we have groupings of utility companies which permit the influence of individual holding company system policies and quality of management to dominate the several size classes. In each of the classifications which was utilized for the purpose of testing the relationship of holding company control and size of operating company to this objective of the Act, there were operating units from all, or at least a representative number of holding company systems. This produced a situation which, through the averaging effect, permitted elements outside of individual holding company policies and quality of management to exert their influence, if any, on the statistical averages. When, however, one attempts to classify holding company systems, he is met at the outset by the fact that as a practical matter there are only 44 units to work with; and since there must necessarily be several size classifications if the particular study is to be of value, it follows that the number of holding company systems represented in each size group is very small. The fact that in each such size group may be found all of the operating units of each of the holding company systems in such size groups, results in the possibility of considerable influence, if not domination, over each group average by the averages of individual systems. This situation is aggravated as to the two largest holding company system size groups classified in Exhibits ..... (VI-A-1) and ..... (VI-A-2) since said groups contain but three and two holding company systems, respectively. It is thus possible as to any of the size groups utilized in said Exhibits, and particularly the two largest size groups, that even one holding company system evidencing unusually poor performance in terms of average electric bills could increase the average figures for such group so as to suggest that holding company systems of that particular size are expensive purveyors of electric energy. Such reasoning is, of course, statistically spurious because it does not permit cognizance of the possibility of wide variations in the average

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electric bills of the individual holding company systems comprising the several size classes. Thus, for example, the average bill for 25 KWH of electricity of one holding company system in the $120,000,000-$160,000,000 size group, shown on Exhibit ..... (VI-A-1), was $1.30 as compared with the figure of $1.88 for another holding company system in the same size group; the average being $1.50.

To summarize this point: It is only reasonable to expect that some holding companies are well managed, some poorly so; that some follow policies leading to low electric rates, and some follow policies leading to higher rates; that some are expensive for consumers, and some are economical. Therefore, while the amounts of electric bills paid by consumers are undoubtedly influenced by the holding companies which control the operating units which render such bills, there are factors, other than size of holding company systems, related to the noted differences in the average bills. It is reasonable to conclude that the quality of holding company management, rather than the fact that the operating companies are units of holding company systems of varying sizes, accounts for the differing averages in electric bills.

Q. Looking at your entire study designed to test the relationship of the size of holding company system to the cost of electric service to consumers, what is your general conclusion? A. In my opinion, the size of the holding company system as such has no significant relationship to cost of electric service to consumers who are served by the operating companies making up such holding company system. Certainly, there is no evidence whatever that an increase in the size of the holding company system as such tends to cause any increase in the amounts of electric bills rendered by the operating units making up such system.

VI-A-1
(I-D-1)

Exhibit ____

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY SUBSIDIARY UTILITIES; CLASSIFIED BY SIZE OF HOLDING COMPANY SYSTEM, AS OF JANUARY 1, 1940

No. of H. C. Systems	Total Gross Revenue of Holding Company System	Weighted Average Typical Bills* 25 KWH	100 KWH	250 KWH	Population Served† Number	Per Cent of Total	Sales to Ultimate Consumers Amount ($000)	Per Cent of Total	No. of Companies‡	Average Population per Company	Average Sales Per Capita	Average Sales Per Company ($000)
8	Under $2,000,000	$1.94	$5.02	$8.47	147,331	0.30%	$ 4,008	0.30%	24	6,139	27.20	$ 167
9	2,000,000-5,000,000	1.82	4.72	8.53	403,102	0.83	12,778	0.95	40	10,078	31.70	319
5	5,000,001-20,000,000	1.54	4.25	7.70	1,528,736	3.14	37,713	2.82	33	46,325	24.67	1,143
5	20,000,001-40,000,000	1.62	4.35	7.71	2,755,921	5.66	76,913	5.75	41	67,218	27.91	1,876
6	40,000,001-80,000,000	1.57	4.46	8.01	11,890,180	24.42	322,159	24.07	104	114,329	27.09	3,098
6	80,000,001-120,000,000	1.39	3.94	7.25	13,118,976	26.94	364,801	27.26	93	141,064	27.81	3,923
3	120,000,001-160,000,000	1.50	4.17	7.27	10,391,865	21.34	290,889	21.74	65	159,875	27.99	4,475
2	Over $160,000,000	1.32	3.67	6.90	8,460,850	17.37	229,064	17.12	54	156,682	27.07	4,242
44	Total Companies	$1.47	$4.11	$7.43	48,696,961	100.00%	$1,338,325	100.00%	454	107,262	27.48	$2,948

* Weighted by "Population Served."

† According to 1930 U. S. Census.

‡ Companies counted in each state in which they serve.

Source of all data: Federal Power Commission Reports.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Q. Please describe the second section of your third major group of studies, namely, that designed to show the relationship between size of holding company system and economy of operation and management of holding company subsidiaries. A. This section of the studies seeks to determine whether the factor of size of holding company system has any relationship, and, if so, what relationship to each of the four indexes or measures of economy of operation and management which have been used in connection with previous studies and which I have already explained.

Q. In this connection, have you prepared a table entitled, "Management Indexes for Subsidiary Electric Utilities; Classified by Size of Holding Company System, 1939?" A. Yes.

(Have Exhibit VI-B-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VI-B-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. What were the sources of the data set forth thereon? A. The data were secured from the same sources as those presented on Exhibit ..... (IV-B-1).

Q. Please describe Exhibit ..... for Identification (VI-B-1). A. It is a table which classifies the subsidiary companies of the same 44 holding company systems into eight classifications according to size. The size groupings are the same as those employed on Exhibit ..... (VI-A-1). The table shows as to the group of operating companies in each holding company system size classification, for the year 1939, the average typical bills for, respectively, 25, 100 and 250 KWH of electricity. These bills have been arrived at in the manner I explained when I was discussing Exhibit (IV-B-1). Exhibit ..... for Identification (VI-B-1) also shows, in respect of the group of operating companies in each holding company system size class, the average executive expense per $1,000 of revenue, the average admin-

istrative and general expense per $1,000 of revenue, and the ratio between such average administrative and general expense and total expenses. It also classifies in the same eight size groups those holding company subsidiaries which employ mutual service companies and shows, as to each such size group, the average management fees per $1,000 of revenue and the ratio between such average management fees and total expenses. The Exhibit also shows the number of holding company subsidiaries comprising the sample utilized in the analysis of each of the several management indexes.

Q. Do you regard the number of holding company systems comprising each of the several size groups as an adequate sample upon which to predicate statistical conclusions as to the common performance of such size group? A. In view of the fact that there are only 44 holding company systems to be classified into eight groupings according to size, there can be no question but that the number of systems in each size grouping is so small as to raise considerable doubt as to the statistical reliability of the average figures. This is particularly true with respect to the two largest size groups which together comprise only five holding company systems. Accordingly, under the circumstances, the average figures as to the two largest size groups must be regarded as probably unreliable from a statistical viewpoint, and the average figures as to the other six size groups should not be accepted as indicative of any trend unless such trend clearly and unmistakably appears.

(Here offer Exhibit ..... for Identification (VI-B-1) in evidence.)

Q. Subject to the qualifications which you have stated, what does Exhibit ..... (VI-B-1) indicate with respect to the relationship between size of the holding company system and economy of management and operation of the subsidiary companies thereof, as measured by the index of average typical electric bills for 25, 100 and 250 KWH of electricity, respectively? A. The Exhibit indicates that the

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average typical electric bill index for operating companies, at all three use levels, tends to decrease with the increase in the size of the holding company system. A definite break appears in this trend with respect to the holding company systems in the next to the largest size group, that is, for those operating companies in systems having total gross revenues between $120,000,000 and $160,000,000. This break need not be regarded as indicating any interruption of the trend in view of the fact that there are but three holding company systems represented in said size group. Notwithstanding the unsatisfactory distribution of companies in this sample, the trend as to average electric bills between the several size classes is so continued and pronounced as to justify the conclusion that there is no evidence whatever that economy of operation and management of operating utilities, as reflected in the average electric bill index, tends to be adversely affected as the size of the holding company system increases. In fact, what statistical evidence there is on this point is to the contrary.

Q. What does Exhibit ..... (VI-B-1) indicate with respect to the relation of size of holding company system to economy of management and operation of the operating units therein, as measured by average executive expenses per $1,000 of revenue of the subsidiary companies? A. If we look at the average executive expense figures for the first four of the holding company system size classifications, that is, the four smallest size groups, there would appear to be some tendency for the average executive expense to decrease as the size of the holding company system increases. But if these figures indicate a trend, it completely disappears in the figures for the four remaining size groups. The average executive expense figures for the four largest size classifications fluctuate up and down without indication of any trend whatsoever. It seems quite clear, therefore, that no conclusion as to any affirmative trend may be fairly predicated upon these figures. Data as to average executive expense per $1,000 of revenues are available only with respect to 318 of the 454 holding company subsidiaries as to which average electric bill data are set forth on Exhibit

..... (VI-B-1). Accordingly, so far as average executive expense is concerned, the meagerness of the sample which results from the fact that there are only 44 holding company systems to start with is accentuated by the fact that the particular data in question is available only with respect to about 75% of the operating companies comprising said 44 systems. In view of the inadequacy of the sample, the only conclusion which the index may be fairly said to support is the tentative one that there is no trend one way or the other.

Q. What does Exhibit ..... (VI-B-1) indicate with respect to the relationship of size of holding company system to economy of management and operation of the operating companies therein, as measured by the index of average administrative and general expense per $1,000 of revenue? A. All the comments which I made with respect to the significance of the average executive expense figures apply with added force to the average administrative and general expense figures. Here there are data available only with respect to 272 out of 454 holding company subsidiaries. Thus, for example, while eight holding company systems are included in the smallest size group shown on Exhibit ..... (VI-B-1), average administrative and general expense data are available for only six of the operating companies in the entire eight holding company systems. Obviously, no statistical significance can be given to the very high figure for average administrative and general expense for this smallest holding company system size group.

Similarly, no real statistical significance can be given to the average administrative and general expense figures for the holding company systems in the two largest size groups, since there are only two systems in the largest group and only three systems in the next to the largest group. The effect, from a statistical viewpoint, of having too few units in the class can be illustrated by looking at the individual figures with respect to the five holding company systems comprising the two largest size groups.

Q. Have you prepared a table showing the average administrative and general expense per $1,000 of revenue for

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the operating companies in each of the two holding company systems comprising the largest size group and for the operating companies in each of the three holding company systems comprising the next largest size group? A. Yes.

(Have Exhibit VI-B-2 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VI-B-2) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

(Here offer Exhibit ..... for Identification (VI-B-2) in evidence.)

Q. Have you any comments to make with respect to Exhibit ..... (VI-B-2)? A. Looking at the data set forth on this table, it is perfectly apparent that within the two largest holding company system size groups there is no discernible relationship whatever between the relative size of the individual holding company systems and their respective average costs of administration. In one size class, the "over $160,000,000 class," we find Cities Service Company subsidiaries averaging $93.56 per $1,000 of revenue for administrative and general expense alongside North American Company subsidiaries averaging $53.02, while the average for the group is $85.39. Likewise in the next largest holding company system group, the $120,000,000 to $160,000,000 size class, are Associated Gas & Electric Company and Commonwealth & Southern Company with average administrative and general expenses of $99.22 and $61.08 per $1,000 of revenue, respectively, while the group average is $76.18. The figures set forth on this table show that, from the point of view of economy of management and operation, there are probably high cost and low cost systems in all of the several size groups; and that when only two or three systems comprise a size classification it is quite impossible for average figures to eliminate the dominating influence of individual holding company policies and characteristics.

Q. What does Exhibit ..... (VI-B-1) indicate with respect to the relationship of size of holding company system upon economy of management and operation of the subsidiary companies therein, as measured by the index of average management fees per $1,000 of revenue? A. The data required for applying this index or measure of economy of management are available only in respect of 246 of the 454 holding company subsidiaries and these 246 companies are unduly concentrated in the larger holding company systems. The resulting distribution of the 246 units among the several holding company system size classifications is too erratic to provide averages which are truly representative of the respective performances of the several size groups. The available data as reflected by Exhibit ..... (VI-B-1) shows that the figures as to average management fees move up and down indiscriminately as between the various holding company system size groups. It may be pointed out that the average management fee per $1,000 of revenue for the 29 operating subsidiary companies in the systems comprising the first four holding company system size groups is $20.28. This clearly indicates that the average management fee for the remaining 217 operating subsidiary companies must be considerably less than $20.28 since the average figure for the entire 246 companies is only $14.89. While this clue suggests that the average management fees per $1,000 of revenue tend to decrease as the size of holding company system increases, the only conclusion statistically warranted by the particular study is that there appears to be no continuing relationship between mere size of holding company system as such and economy of management and operation, as measured by average management fees per $1,000 of revenue.

Q. What are your general conclusions with respect to the subject matter of the second section of your third group of studies? A. It has always been my opinion that policies of management of the individual holding company system are a dominant influence in the performance of operating companies making up such system, no matter

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how measured. The only opportunity for statistical conclusions arises when a classification of operating companies cuts a cross-section from good, bad and indifferent holding company systems; in such situation average figures would tend to focus light on variables such as size of operating company, size of community served, etc. Although Exhibit ..... (VI-B-4) is subject to the charge that the individual characteristics of the 44 holding company systems dominate the average figures, some statistical conclusions may be justified. Thus, it rather clearly appears that the average electric bills of holding company subsidiaries tend to decrease in amount as the size of the holding company system increases. It does not appear that there is any definite pattern of relationship between size of holding company system and the other indexes or measures of economy of management and operation which I have employed. On the whole picture I conclude that there is certainly no evidence that the economy of management and operation of holding company subsidiaries tends to be affected adversely as the size of the holding company system increases; such evidence as there is on the point being to the contrary.

VI-B-1
(II-D-1-2-3-4)

MANAGEMENT INDEXES FOR SUBSIDIARY ELECTRIC
BY SIZE OF HOLDING COMPANY SYS

No. of H. C. System	Total Gross Revenue of Holding Company System	1 — Average Typical Bills — No. of Companies	25 KWH	100 KWH	250 KWH	2 — Av. Executive Expense per $1,000 Rev. — No. of Companies	Av.	N Com
8	Less than 2,000,000	24	$2.08	$5.65	$9.21	12	$28.79	
9	2,000,001 to 5,000,000	40	2.06	5.08	9.12	26	19.13	
5	5,000,001 to 20,000,000	33	1.89	4.84	8.59	19	14.08	
5	20,000,001 to 40,000,000	41	1.80	4.72	8.32	25	10.08	
6	40,000,001 to 80,000,000	104	1.76	4.77	8.50	81	13.92	
6	80,000,001 to 120,000,000	93	1.63	4.25	7.70	66	11.87	
3	120,000,001 to 160,000,000	65	1.79	4.75	8.37	51	11.58	
2	Over 160,000,000	54	1.57	4.24	7.80	38	14.92	
44	Total Companies	454	$1.77	$4.67	$8.32	318	$13.93	2
	Per Cent of Sample by Sales		100	100	100	98		

* Includes only those companies operating under mutual service agreements.

Source of data: Federal Power Commission Reports.
Moody's Manual of Public Utilities, 1940.

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OVERSIZE PAGE– SEE NEXT FRAME

Exhibit .....

EMENT INDEXES FOR SUBSIDIARY ELECTRIC UTILITIES; CLASSIFIED BY SIZE OF HOLDING COMPANY SYSTEM; 1939

1			2		3				4			
Average Typical Bills			Av. Executive Expense per $1,000 Rev.		Av. Adm. & Gen'l Expense per $1,000 Rev.		Av. Adm. & Gen'l Expense as Per Cent of Total Expense		Av. Mgt. Fees per $1,000 Revenue*		Av. Mgt. Fees as Per Cent of Total Expense*	
KWH	100 KWH	250 KWH	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.
$2.08	$5.65	$9.21	12	$28.79	6	$95.95	6	20.19%	11	$32.65	2	5.08%
2.06	5.08	9.12	26	19.13	13	72.20	13	14.61	3	44.83	1	6.56
1.89	4.84	8.59	19	14.08	16	69.99	16	14.48	3	7.67	1	1.62
1.80	4.72	8.32	25	10.08	23	63.00	22	14.11	12	5.95	11	1.53
1.76	4.77	8.50	81	13.92	77	65.44	75	13.81	78	22.03	67	4.43
1.63	4.25	7.70	66	11.87	57	73.16	57	17.62	59	7.17	52	1.94
1.79	4.75	8.37	51	11.58	45	85.39	45	18.09	53	10.93	38	1.82
1.57	4.24	7.80	38	14.92	35	76.18	35	17.22	27	13.60	21	3.15
$1.77	$4.67	$8.32	318	$13.93	272	$72.80	269	16.02%	246	$14.89	193	2.95%
100	100	100	98		98		97		98		89	

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Av.

5.08%
6.56
1.62
1.53
4.43
1.94
1.82
3.15
2.95%

Exhibit .....

VI-B-2
(II-D pg. 3)

AVERAGE ADMINISTRATIVE AND GENERAL EXPENSE PER $1,000 OF REVENUE FOR LARGE SIZE HOLDING COMPANY SYSTEMS

Total Gross Revenues	Number of Companies	Name of System	Average Adm. & Gen. Expense per $1,000 of Revenue
$120,000,001	28	Associated Gas & Electric Co.	$99.22
to	10	Commonwealth & Southern Co.	61.08
$160,000,000	7	United Gas Improvement Co.	64.78
over	20	Cities Service Co.	93.56
$160,000,000	15	North American Company	53.02

Sources:—Moody's 1940 Public Utility Manual.
Company reports to the F.P.C. on Form Nos. 1, 96 and 97.

Q. Please describe now the third section of your third major group of studies, namely, that designed to show the relationship between the size of a holding company system and the soundness of the financial management of the subsidiaries thereof. A. This part of my studies seeks to determine what relationship, if any, the factor of size of holding company systems has to each of the several ratios of income administration which I have utilized in connection with prior studies. I have previously explained these ratios.

Q. In connection with this present study, have you prepared a table entitled, "Income Administration Ratios of Subsidiary Utilities; Classified According to Size of Holding Company System, 1939?" A. Yes.

(Have Exhibit VI-C-1 marked Exhibit ..... for Identification)

Q. Was Exhibit ..... for Identification (VI-C-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (VI-C-1). A. It will be recalled that the study dealing with the relationship between holding company control over utilities and the soundness of their financial management was predicated upon a statistical sample of 288 utility companies in respect of which the particular financial data were available. Of such 288 utility companies, 221 are holding company subsidiaries. Exhibit ..... for Identification (VI-C-1) is a table which classifies said 221 holding company subsidiaries into eight holding company system size classifications. The size classifications are the same as those utilized on Exhibits ..... (VI-A-1) and ..... (VI-B-1). As to each group of operating companies in each such holding company system size classification, Exhibit ..... for Identification (VI-C-1) sets forth the same indexes of "income administration" which have been utilized on prior Exhibits.

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(Here offer Exhibit ..... for Identification (VI-C-1) in evidence)

Q. What does Exhibit ..... (VI-C-1) indicate with respect to the relationship of size of holding company system to the soundness of the financial management of the subsidiaries thereof, as measured by the indexes which you have employed? A. The division of said 221 holding company subsidiaries into the eight holding company system size groups produces certain groups with units too few in number to provide reliable averages. Nevertheless, looking at the ratios for the respective holding company size classifications, there appear to be a few trends or patterns of possible significance. There appears to be a tendency, for instance, for the proportion of income distributed to be greater in the larger size holding company systems, and there seems to be a corresponding tendency for companies in smaller systems to retain a larger portion of earnings in the business. In my opinion, however, neither of these situations is truly a function of size of holding company system. This fact is apparent when one compares the profit distribution and earning retentions of individual companies within the several size groups.

Q. In that connection, have you prepared a table showing some of the ratios set forth on Exhibit ..... (VI-C-1) as to individual companies in the two largest holding company system size classifications? A. Yes.

(Have Exhibit VI-C-2 marked Exhibit ..... for Identification)

Q. Was Exhibit ..... for Identification (VI-C-2) prepared by you or under your supervision? A. Yes.

Q. Does it accurately set forth certain details which comprise part of Exhibit ..... (VI-C-1)? A. It does.

(Here offer Exhibit ..... for Identification (VI-C-2) in evidence)

Q. What does Exhibit ..... (VI-C-2) indicate with respect to the differences between the policies of the individual holding company systems upon which the average figures are based? A. It shows very wide differences. These differences lie chiefly in the balances of income remaining after payment of fixed charges, that is, average common stock earnings as per cent. of income, and the portions of income distributed to residual equity holders, that is, average common dividends as per cent. of common stock earnings. Thus it appears that Associated Gas and Electric Company and United Gas Improvement Company were much less conservative in the amount of common stock dividends which they withdrew from their subsidiaries than was Commonwealth and Southern Corporation, the other system in the same holding company size group. This fact combined with Associated's heavy fixed charges resulted in an average total distribution of 97% of income within that particular system as compared with Commonwealth and Southern's average distribution of 81.8% of income.

Q. What are your general conclusions on the particular point at issue? A. In my opinion there is no real relationship between the size of a holding company system as such and the soundness of the financial management of the operating companies in such system.

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Exhibit .....

VI-C-1
(III-B-4)

INCOME ADMINISTRATION RATIOS OF SUBSIDIARY UTILITIES; CLASSIFIED ACCORDING TO SIZE OF HOLDING COMPANY SYSTEM, 1939

	Averages	a	b	c (100 — a)	d	e (c + d)	f (100 — b)	g (100 — e)
Total Gross Revenues of Holding Company System	Number of Companies	Common Stock Earnings as Per Cent of Income	Common Dividends as Per Cent of Common Stock Earnings*	Interest Plus Preferred Dividends as Per Cent of Income	Common Stock Dividends as Per Cent of Income	Earnings Spent for All Capital as Per Cent of Income	Earnings Retained as Per Cent of Common Stock Earnings*	Earnings Retained as Per Cent of Income
Less than $2,000,000	3	48.4	42.4	51.6	17.1	68.7	57.6	31.3
$2,000,000-$5,000,000	10	29.0	7.6	71.0	3.0	74.0	92.4	26.0
$5,000,001-$20,000,000	11	53.6	45.6	46.4	33.9	80.3	54.4	19.7
$20,000,001-$40,000,000	22	34.7	38.5	65.3	19.2	84.5	61.5	15.5
$40,000,001-$80,000,000	76	53.0	58.4	47.0	41.8	88.8	41.6	11.2
$80,000,001-$120,000,000	40	35.7	63.0	64.3	27.0	91.3	37.0	8.7
$120,000,001-$160,000,000	36	36.1	58.4	63.9	28.3	92.2	41.6	7.8
Over $160,000,000	23	37.7	61.2	62.3	28.5	90.8	38.8	9.2
Total Companies	221	42.6	54.9	57.4	30.8	88.2	45.1	11.8

* Average computed excluding 12 companies neither earning nor paying common stock dividends.
Source of data: Moody's Manual of Public Utilities, 1940.

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Exhibit .....

VI-C-2
(III-B-4 pg. 17)

POLICIES OF INCOME ADMINISTRATION OF LARGE HOLDING COMPANY SYSTEMS (1939)

System	Number of Companies	Average Common Stock Earnings as Per Cent of Income	Average Common Dividends as Per Cent of Common Stock Earnings	Average Earnings Spent for Capital as Per Cent of Income	Average Earnings Retained as Per Cent of Common Stock Earnings
Associated Gas and Electric.....	20	30.0%	60.2%	96.8%	39.8%
Commonwealth and Southern Corporation	10	33.7	41.2	81.8	58.8
United Gas Improvement Company	7	60.5	82.1	93.9	17.9
Cities Service Company.....	11	35.2%	51.8%	89.4%	48.2%
North American Company.....	12	39.9	70.5	92.3	29.5

Source of Data: Moody's 1940 Public Utility Manual.

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Q. Will you now describe the fourth and last section of your third major group of studies. A. This particular section of my studies is designed to determine what relationship, if any, the factor of size of holding company system has to the protection of investors in operating utilities. For the purposes of this study, I have used the same indexes or measures of investment protection which I have used in connection with similar studies heretofore described.

Q. As part of this section of your studies, have you prepared a table entitled, "Investor Protection Ratios of Subsidiary Utilities Classified According to Size of Holding Company System, 1939"? A. Yes.

(Have Exhibit VI-D-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VI-D-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. From what sources were the data set forth therein secured? A. From the same sources as the data set forth in Exhibit ..... (IV-D-1), which sources have already been described.

Q. Please describe Exhibit ..... for Identification (VI-D-1). A. It is a table which classifies three groups of holding company subsidiaries, in the respective numbers of 210, 161 and 221 companies, into eight classifications based on the size of the holding company system of which they are a part. These are the same groups of holding company subsidiaries as were classified in different ways in earlier exhibits, namely, Exhibits ..... (IV-D-1) and ..... (V-D-1). The same holding company size classifications have been used in Exhibit ..... for Identification (VI-D-1) as in case of the earlier exhibits mentioned. This table shows, in respect of the bonds and preferred stocks of the group of companies in each of the several holding company system size classifications, (1) the average number of times bond interest has been earned, (2) the average percentage

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of gross revenues remaining after bond interest, (3) the average number of times bond interest plus preferred stock dividends have been earned, and (4) the average percentage of gross revenues remaining after both bond interest and preferred stock dividends. The table also shows with respect to the group of companies in each of said size groups, the average ratio of common stock earnings to income.

(Here offer Exhibit ..... for Identification (VI-D-1) in evidence.)

Q. What does Exhibit ..... (VI-D-1) indicate with respect to the relationship of the size of a holding company system to the protection afforded to bondholders and preferred stockholders of the subsidiary companies thereof, as measured by the indexes which you have employed? A. It is apparent from a glance at the Exhibit that the variations in the average ratios set forth thereon are so erratic and haphazard that they cannot be related to increases or decreases in the size of holding company system. No conclusion can be reached other than that there is no relationship between the size of a holding company system as such and the character or quality of the investment protection afforded to holders of the securities of the operating companies in such system.

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Exhibit .....

VI-D-1
(IV-D-1, 2, 3)

INVESTOR PROTECTION RATIOS OF SUBSIDIARY UTILITIES CLASSIFIED ACCORDING TO SIZE OF HOLDING COMPANY SYSTEM, 1939

Total Gross Revenues of Holding Company System	1 — Bond Protection			2 — Preferred Stock Protection			3 — Balance of Income	
	Number of Companies	Average Times Interest Earned	Average Per Cent Revenue Remaining after Interest	Number of Companies	Average Times Dividends and Interest Earned	Average Per Cent Revenue Remaining after Preferred Dividends	Number of Companies	Average Common Stock Earnings as Per Cent of Income
Less than $2,000,000	3	2.6	18.0%	2	1.7	12.6%	3	48.4%
$2,000,000 to $5,000,000	10	2.0	13.2	7	1.3	5.7	10	29.0
$5,000,001 to $20,000,000	10	4.6	14.6	5	1.9	13.2	11	53.6
$20,000,001 to $40,000,000	21	2.5	14.0	15	1.3	6.6	22	34.7
$40,000,001 to $80,000,000	66	6.8	16.6	45	1.6	9.4	76	53.0
$80,000,001 to $120,000,000	40	2.6	17.5	38	1.7	11.2	40	35.7
$120,000,001 to $160,000,000	37	2.5	16.8	29	1.7	11.1	36	36.1
Over $160,000,000	23	2.7	16.6	20	1.8	11.3	23	37.7
Total Companies	210	4.1	16.3%	161	1.7	10.1%	221	42.6%

Source of data: Moody's Manual of Public Utilities, 1940.

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Q. Up to this point, Dr. Waterman, you have discussed the relationship to the objectives of the Act of three factors, namely, (1) holding company control over utilities, (2) size of operating company, and (3) size of holding company system. Have you, in your studies, attempted to test the relationship of any other factor to the same statutory objectives? A. Yes. I made a fourth group of studies by which I sought to discover whether the distance of a holding company subsidiary from the main office or general headquarters of its holding company, in and of itself, has any relationship, and, if so, what relationship, to the objectives of the Act, as measured by the same four indexes previously described namely, (1) cost of electric service to consumers, (2) economy in the management and operation of utilities, (3) soundness of financial management of utilities and (4) protection of investors.

Q. What specifically led you to make this fourth group of studies? A. During the conversation with attorneys for the respondents to which I referred at the outset of my testimony, they called my attention to a publication of the Public Utilities Division of the S.E.C. dated December 6, 1939, entitled "Charts Showing Location of Operating Electric and/or Gas Subsidiaries of Registered Public Utility Holding Companies", with which I was familiar. Said publication contains a series of maps showing the rail line distance of each holding company subsidiary from the main office or general headquarters of its holding company. Referring to the maps in this publication, counsel for respondent requested that I undertake to analyze all holding company subsidiaries according to their distance from the main office of their respective holding companies upon the same basis as that employed in the publication to which I have referred, or on a substantially similar basis, in an effort to determine what relationship, if any, the factor of distance of operating company from its general headquarters might bear to the objectives of the Public Utility Holding Company Act.

Q. And you made such a study? A. Yes, although I told respondent's attorneys at the time that I could see no logical

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reason for so doing. In fact, I told them that in my opinion such an analysis would probably savor of statistical "monkey business" because I could not see any possible basis for expecting any kind of relationship between distance of operating companies from general headquarters and the objectives of the Act. However, I proceeded to prepare the analysis suggested because respondents desired to cover the possibility that some such relationship might exist.

Q. Will you briefly describe the basis of classifying holding company subsidiaries according to distance from general headquarters which you employed in your study? A. My classification was predicated upon air line mileage instead of rail line mileage because of the greater convenience of figuring the former. The air line measurements were accomplished by use of a scale map of the United States and by this method I determined the distance from the main office of each holding company to the approximate center of the operating area of each of its operating subsidiaries. While these distance figures do not coincide exactly with those contained in the publication of the Public Utilities Division of the S.E.C. dated December 6, 1939, just mentioned, they accomplish the same results because they make possible a classification of holding company subsidiaries based on their relative distances from holding company general headquarters.

Q. As part of the study, did you prepare a document entitled, "Average Typical Electric Bills Charged by Subsidiary Utilities; Classified by Distance from General Headquarters as of January 1, 1940"? A. Yes.

(Have Exhibit VII-A-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VII-A-1) prepared by you or under your supervision? A. Yes.

Q. Does it show on its face the source of the data set forth therein? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (VII-A-1). A. It is a table which classifies the 454 utilities constituting the holding company subsidiary segment of my sample, into five different groups based on the distance of the holding company subsidiaries from the main office or general headquarters of their respective holding companies. Thus, the first group consists of subsidiaries which are located less than 200 miles from the main office of their respective holding companies. The second group consists of subsidiaries which are located between 200 and 500 miles from the main office of their respective holding companies, and so on. As to the group of companies in each of such five "distance from general headquarters" classifications, the table shows the average typical bills for 25, 100 and 250 KWH of electricity, respectively. These average bills cover only residential electric service and have been weighted according to the population served in the manner I have previously described in connection with earlier exhibits. The table also shows, as to the group of holding company subsidiaries in each of the five classifications, the population served, both in numbers and as a percentage of the total population, the dollar value of sales of electricity to ultimate consumers, and the percentage of total sales represented by each group, the average population served per company and the average dollar amount of sales of electricity to consumers both per capita of population served and per company in the group. The number of holding company subsidiaries comprising each "distance from general headquarters" classification is also shown.

(Here offer Exhibit ..... for Identification (VII-A-1) in evidence.)

Q. What does Exhibit ..... (VII-A-1) indicate with respect to the relationship, if any, between the distance of the operating utility from general headquarters and the cost of electric service to consumers? A. From a first glance at the average figures on the table one might assume that there was a tendency for the electric bills to decrease in

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amount as the distance of the operating company from general headquarters increased. Statistically, it appears that the consumers who are supplied with electricity by holding company subsidiaries closest to their general headquarters pay the highest average bills while consumers who are supplied by holding company subsidiaries located at the greatest distance from their general headquarters pay the lowest average bills. Inspection of the "in-between" distance from headquarters classes, however, shows considerable ups and downs in the average bill figures and demonstrates that there is no trend running throughout all the classifications and that any attempt to attribute a causal relation between the amounts of electric bills and distance of the operating companies from headquarters would be statistically spurious. It is a statistical fact, however, that the companies between 200 and 500 miles from general headquarters and the companies between 500 and 1,000 miles from general headquarters have lower average bills at all three use levels than the companies less than 200 miles from general headquarters. A possible explanation for this situation may become apparent when I discuss a later exhibit. I certainly do not believe that Exhibit ..... (VII-A-1) may be relied upon as showing a tendency for electric bills to decrease as the distance of the operating company from general headquarters increases, nor can it prove the contrary. To me, it demonstrates that the distance of the operating company from its general headquarters does not in and of itself tend to be accompanied by any significant change in the amount of electric bills. The validity of this conclusion will become more apparent after the presentation of other studies indicating certain geographic factors which apparently affect this entire distance from headquarters study.

VII-A-1
(I-C-1)

Exhibit .....

AVERAGE TYPICAL ELECTRIC BILLS CHARGED BY SUBSIDIARY UTILITIES; CLASSIFIED BY DISTANCE FROM GENERAL HEADQUARTERS AS OF JANUARY 1, 1940

Distance from General Headquarters	Weighted Average Typical Bills* 25 KWH	100 KWH	250 KWH	Population Served† Number	Per Cent of Total	Sales to Ultimate Consumers Amount ($000)	Per Cent of Total	No. of Companies‡	Average Population per Company	Average Sales Per Capita	Average Sales Per Company ($000)
Under 200 miles	$1.57	$4.40	$7.83	14,192,818	29.15%	$ 385,756	28.82%	124	114,458	27.18	$3,111
200-500 miles	1.39	3.95	7.30	14,923,507	30.65	419,838	31.37	96	155,453	28.13	4,373
501-1,000 miles	1.42	3.86	6.99	11,937,460	24.51	323,475	24.17	108	110,532	27.10	2,995
1,001-2,000 miles	1.54	4.35	7.73	6,691,801	13.74	177,838	13.29	97	68,988	26.58	1,833
Over 2,000 miles	1.32	3.74	6.97	951,375	1.95	31,418	2.35	29	32,806	33.02	1,083
Total Companies	$1.47	$4.11	$7.43	48,696,961	100.00%	$1,338,325	100.00%	454	107,262	27.48	$2,948

* Weighted by "Population Served."

† According to 1930 U. S. Census.

‡ Companies counted in each state in which they serve.

Source of all data: Federal Power Commission Reports.

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Q. Will you now describe the second section of your fourth major group of studies? A. This part of my studies seeks to determine what relationship, if any, the factor of distance of the operating company from general headquarters has to each of the same four indexes or measures of economy of operation and management which I have heretofore used, namely, (1) average typical electric bills, (2) average executive expense, (3) average administrative and general expense, and (4) management fees.

Q. In connection with this particular study, have you prepared a table entitled, "Management Indexes for Subsidiary Electric Utilities; Classified by Distance from General Headquarters; 1939?" A. Yes.

(Have Exhibit VII-B-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VII-B-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. What are the sources of the data set forth thereon? A. The data were secured from the same sources as those set forth in Exhibits ..... (IV-B-1) and ..... (VII-A-1).

Q. Please describe Exhibit ..... for Identification (VII-B-1). A. It is a table which classifies the same 454 holding company subsidiaries into five different groups based on the distance of the subsidiaries from the main office or general headquarters of their respective holding companies. The distance from general headquarters classifications are the same as those used in Exhibit ..... (VII-A-1). The table shows, as to the group of holding company subsidiaries in each of such "distance from general headquarters" classifications, for the year 1939, the average typical bills for, respectively, 25, 100 and 250 KWH of electricity. The table also classifies other groups of holding company subsidiaries, less than 454 in number, into the same five "distance from general headquarters" classifications, and shows as to each such classification the

average executive expense per $1,000 of revenue, the average administrative and general expense per $1,000 of revenue, and the ratio between average administrative and general expense and total expenses. The table also classifies in the same five distance from headquarters groups those holding company subsidiaries which employ a mutual service company for their management, and shows, as to each such group, the average management fees per $1,000 of revenue and the ratio between such average management fees and total expenses.

(Here offer Exhibit ..... for Identification (VII-B-1) in evidence.)

Q. What does Exhibit ..... (VII-B-1) indicate with respect to the relationship of distance of the operating company from its general headquarters to the economy of management and operation thereof, as measured by average typical bills for 25, 100 and 250 KWH of electricity? A. None of the variations between average bills for the companies in the several distance from headquarters classifications are very marked. The highest average bills are found for companies located from 1,000 to 2,000 miles from general headquarters. Then come the locally managed companies, that is, the companies less than 200 miles from headquarters with the next highest average bills. The companies more than 2,000 miles away are third in line and the lowest average bills are found for companies located from 200 to 1,000 miles from general headquarters. To state it differently, the table shows statistically that the most efficient operations, as measured by this particular index, are exhibited by the companies within the 200 to 1,000 mile radius and that the least efficient operations are exhibited by the companies within 200 miles from headquarters and between 1,000 and 2,000 miles from headquarters, with the most distant units, that is the companies more than 2,000 miles away, being generally in between these two groups. The table presents rather convincing evidence that mere increase in the distance of the operating company from general headquarters in and of itself

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does not tend to be accompanied by any change in the average amount of electric bills.

Q. You have just called attention to the fact that subsidiaries operating within areas 200 to 1,000 miles from headquarters show the lowest average electric bills. Has that fact any significance, in your opinion? A. My opinion, formed after some investigation, is that a very plausible explanation lies in the fact that the general headquarters for most of the public utility holding companies are either in New York, Boston or Philadelphia. Thirty-two out of the 44 holding company systems included in my studies have headquarters in the three cities mentioned, and 322 out of the total of 456 holding company subsidiaries are controlled by said 32 systems. Seventy-eight per cent. of all sales of electricity by holding company subsidiaries are accounted for by the subsidiaries of the 32 holding companies whose headquarters center in New York, Boston and Philadelphia. Likewise, 78% of the population served by holding company subsidiaries is served by companies whose holding company headquarters are in the general area of said three cities. These facts establish beyond a doubt that the statistics in Exhibit ..... (VII-B-1) are dominated by a geographical center which is either in or near New York City. The fact that the statistics are so dominated by this single geographic center of influence necessarily means that areas marked by various radii from that central point will embody parts of the United States which have essentially different economic and geographic characteristics. The result, so far as the distance classification used in Exhibit ..... (VII-B-1) is concerned, is to locate the various distance from headquarters areas in sections of the country which have essentially different economic characteristics which in turn means that utilities operating in the various areas in question are operating under vastly different conditions.

Q. In this connection, Dr. Waterman, have you prepared a chart or map entitled, "Population Density Affecting Electric Utility Subsidiaries in Political and Geographical Subdivisions (1939)"? A. Yes.

(Have Exhibit VII-B-2 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VII-B-2) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Please describe Exhibit ..... for Identification (VII-B-2). A. It is an outline map of the United States on which are indicated the same nine geographic or political subdivisions which I employed in Exhibits ..... to ..... (IV-A-4-a to IV-A-4-i) which have heretofore been described and introduced in evidence. On the map appear also a series of concentric arcs all radiating from New York City. The smallest of the arcs is drawn at a radius of 200 miles from New York City. The second concentric arc is drawn at a radius of 500 miles from New York City, the third at a radius of 1,000 miles and the fourth at a radius of 2,000 miles. The areas between the concentric arcs correspond, of course, to the distance from general headquarters classifications set forth in Exhibit ..... (VII-B-1). The map also contains two sets of population figures, one set for the "distance from general headquarters" areas which we have been discussing, and the other set for the nine geographical subdivisions referred to. The figures at the map boundaries indicate the average population per holding company subsidiary within each of the five distance from general headquarters areas as measured from the dominant center of holding company management, namely, New York City. The map also shows a measure of population density in each of the nine geographical subdivisions heretofore mentioned, this population density being expressed in terms of population per holding company subsidiary and average community size.

(Here offer Exhibit ..... for Identification (VII-B-2) in evidence.)

Q. What light, if any, does Exhibit ..... (VII-B-2) shed on the average bill figures appearing on Exhibit .....

(VII-B-1)? A. Although the cities, mountains, deserts, swamps, etc. are not sketched in on the map, which is now Exhibit ..... (VII-B-2), it may readily be observed therefrom that the area within 200 miles from New York City is one of concentrated population and high purchasing power; that the area between 200 and 500 miles from New York City also includes populous cities and prosperous countrysides; that the area between 500 and 1,000 miles from New York City is one of adequate population and generally advantageous operating characteristics from the viewpoint of a public utility; that the area between 1,000 and 2,000 miles from New York City is dominated by sparse populations and sparser pocketbooks, except for a relatively few spots where populations are sufficiently concentrated to make satisfactory utility operations possible; and that the territory more than 2,000 miles from New York City is in part very mountainous and sparsely settled and in part relatively favorable for utility operations where, in the Pacific States, average community size points to favorable population concentrations. This map not only establishes characteristically different operating conditions in the several distances from headquarters areas as based on New York City, but also indicates accompanying differences in average company sizes which, we have already seen, parallel variations in average electric bills. In view of the factors I have mentioned, we would naturally expect to find that the companies located from 1,000 to 2,000 miles from New York City would have higher average bills than companies in the other distance from headquarters classifications; and that is just what Exhibit ..... (VII-B-1) shows on a statistical basis.

Q. What is your general conclusion with respect to the relationship of distance of the operating company from general headquarters upon electric bills? A. My studies indicate that distance of the operating companies from the main office of their respective holding companies is a factor showing a negligible relationship so far as the size of electric bills is concerned. The fact that the lowest average bills are found for companies located from 200 to 1,000

miles from general headquarters, and the fact that the average bills for companies located less than 200 miles from general headquarters are higher than those of companies more than 2,000 miles from general headquarters, not only tends to destroy any statistical correlation between distance from general headquarters and average electric bills, but also plainly suggests the dominant influence of some other factors, such as, size of operating company, size of community served, or character of community served. In any event, it is clear that there is no evidence that average electric bills tend to change in any set manner as the distance of the operating company from general headquarters increases.

Q. What does Exhibit ..... (VII-B-1) indicate with respect to the relation of distance of operating company from general headquarters to economy of management and operation of utilities, as measured by average executive expense per $1,000 of revenue? A. The figures as to average executive expense for the companies in the several distance from general headquarters classifications follows the same patternless path that we found in the average electric bill figures, except that the average executive expense figure for the most distant group of subsidiaries is higher than those for the companies in any other distance from general headquarters bracket. The fact that there are only 16 companies in the group of those most distant from headquarters casts doubt on the statistical reliability of the average figures for that group. But quite apart from that point, the fact that the average executive expenses of the locally managed companies, that is, the companies less than 200 miles from general headquarters, is greater than that for the companies between 200 and 500 miles from general headquarters, and greater than that for the companies between 500 and 1,000 miles from general headquarters, precludes any conclusion that the average executive expense tends to increase as the distance of the operating company from general headquarters increases. It seems clear from a consideration of Exhibits ..... (VII-B-1) that the factor of distance of operating company from general headquarters

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is in and of itself a wholly negligible quantity so far as executive expense is concerned.

Q. What does Exhibit ..... (VII-B-1) indicate with respect to the relationship between distance of operating company from general headquarters and economy of management and operation of utilities, as measured by average administrative and general expense per $1,000 of revenue? A. Looking at the first four distance from general headquarters classifications under this index, there might appear to be a statistical tendency for average administrative and general expense to increase as the distance of the operating company from general headquarters increases. There is no appreciable difference, however, between the figures for the 200 to 500 mile group of companies and those for the 500 to 1,000 mile group of companies. Moreover, the suggested trend is sharply broken by the fact that the average administrative and general expense for companies more than 2,000 miles distant from general headquarters is less than that of companies between 1,000 and 2,000 miles from general headquarters and practically identical with that of companies between 200 and 1,000 miles from general headquarters. Viewing Exhibit ..... (VII-B-1) in terms of administrative and general expense, I have no hesitancy in concluding that mere increase in the distance of the operating company from general headquarters shows no tendency to be accompanied by any relation, adverse or otherwise, to the economy of management and operation thereof as measured by average administrative and general expense.

Q. What does Exhibit ..... (VII-B-1) indicate with respect to the relationship of distance of the operating company from general headquarters to economy of management and operation, as measured by management fees per $1,000 of revenue? A. This particular index, of course, applies only to those holding company subsidiaries which use mutual service companies for management. The average figures for this index move up and down without regard to increase or decrease in the distance of the operating company from general headquarters. The highest average

figures are found for the locally managed companies, that is, the companies less than 200 miles from general headquarters. The expense element represented by travel and communication might be expected to vary with distance, but the figures on Exhibit ..... (VII-B-1) do not seem to be influenced by this factor. In my opinion, the size of management fees is essentially a matter of individual holding company system policy and characteristics which prevail regardless of distance of the operating company from general headquarters.

Q. Looking at all your studies on the particular point under discussion, what is your general conclusion? A. The evidence indicates that a mere increase in the distance of the operating company from the main office of its holding company is not accompanied by any changes in the management indexes which, by any stretch of the imagination, could be taken as measuring a significant relationship between such distance factor and the economy and efficiency of the management and operation of the operating company.

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Exhibit .....

VII-B-1
(II-C-1, 2, 3, & 4)

MANAGEMENT INDEXES FOR SUBSIDIARY ELECTRIC UTILITIES; CLASSIFIED BY DISTANCE FROM GENERAL HEADQUARTERS; 1939

Distance from General Headquarters Distance Groups	1 Average Typical Bills			2 Av. Executive Expense per $1,000 Rev.		3 Av. Adm. & Gen'l Expense per $1,000 Rev.		3 Av. Adm. & Gen'l Expense as Per Cent of Total Expense		4 Av. Mgt. Fees per $1,000 Revenue*		4 Av. Mgt. Fees as Per Cent of Total Expense*	
	No. of Companies	25 KWH	100 KWH	250 KWH	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.	No. of Companies	Av.
Less than 200 miles	124	$1.82	$4.84	$8.62	100	$14.15	86	$66.73	86	13.26%	82	$20.80	67	3.61%
200 to 500 miles	96	1.67	4.50	8.06	73	12.80	61	71.83	61	16.18	56	14.10	42	3.00
501 to 1,000 miles	108	1.70	4.45	7.93	77	12.57	67	72.20	65	16.45	48	8.78	40	2.06
1,001 to 2,000 miles	97	1.87	4.84	8.61	52	14.72	48	85.58	47	19.98	51	12.91	37	2.74
Over 2,000 miles	29	1.83	4.78	8.25	16	21.78	10	73.51	10	17.45	9	9.84	7	2.39
Total companies	454	$1.77	$4.67	$8.32	318	$13.93	272	$72.80	269	16.02%	246	$14.89	193	2.95%
Per cent sample by sales	.....	100	100	100	98	.....	98	.....	97	.....	98	.....	89	.....

*Includes only those companies operating under mutual service agreements.

Source of data: Moody's Manual of Public Utilities, 1940.

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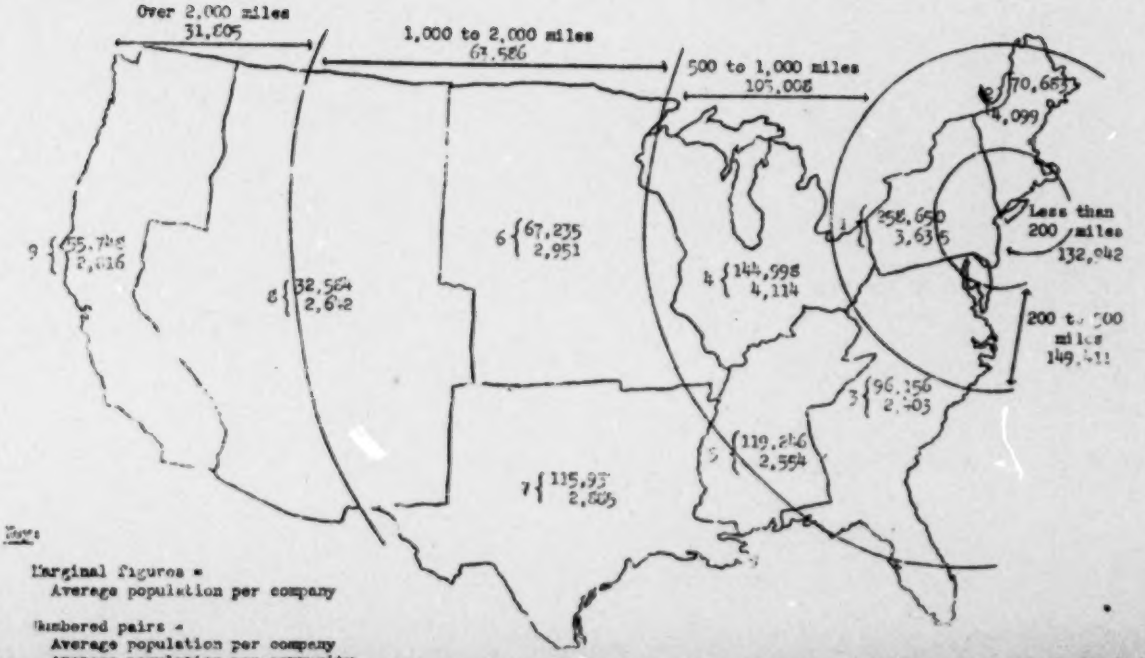

Population Density Affecting Electric Utility Subsidiaries

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Q. Will you please describe the third section of your fourth major group of studies? A. This section of the studies seeks to determine what relationship, if any, distance of the operating company from the main office of its holding company has to each of the several ratios of income administration which I have utilized in connection with prior studies to measure efficiency of financial management.

Q. In this connection, have you prepared a table entitled, "Income Administration Ratios of Subsidiary Utilities; Classified According to Distance from General Headquarters, 1939"? A. Yes.

(Have Exhibit VII-C-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VII-C-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. What were the sources of the data set forth thereon? A. The data were secured from the same sources as those set forth on Exhibits ..... (IV-C-5) and ..... (VII-C-1), which sources have already been described.

Q. Please describe Exhibit ..... for Identification, (VII-C-1). A. It will be recalled that in Exhibit ..... (VI-C-1) 221 holding company subsidiaries were classified into various size of holding company system classifications. Exhibit ..... for Identification, (VII-C-1) is a table which classifies the same 221 holding company subsidiaries into five different groups based on the distance of the operating company from the main office or general headquarters of its holding company. The table shows as to the group of companies comprising each distance from general headquarters classification, for the year 1939, the same ratios of income administration as were utilized in previous Exhibits.

(Here offer Exhibit ..... for Identification (VII-C-1) in evidence.)

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Q. What does Exhibit ..... (VII-C-1) indicate with respect to the relationship between distance of operating companies from their respective holding company general headquarters and the soundness of their financial management, as measured by the various indexes which you have employed? A. It does not afford any evidence that the factor of distance of operating company from its holding company headquarters in and of itself has any relationship whatsoever to the soundness or quality of the financial management of the operating company. The several ratios for the last three distance from general headquarters classifications appear to be practically identical throughout the table. While it does appear that the companies located less than 200 miles from general headquarters distribute a much smaller proportion of their earnings to bondholders and preferred stockholders, (column c), and by the same token, a larger portion of their earnings to common stockholders (column d), than do the companies more than 200 miles from general headquarters, the explanation for this variance need not lie in variations of the distance of operating companies from headquarters when it could as well be related to the fact of geographical location. For example, of the 68 subsidiaries comprising the class located less than 200 miles from general headquarters, 57, or 84%, thereof, belong to holding company systems whose general headquarters are located in New York City or vicinity. This means, of course, that the subsidiaries comprising this particular distance from headquarters classification are dominated by New York and New England operating companies, and thus do not in any sense comprise a representative class from a geographical point of view. Incidentally, it may be noted that, as shown on Exhibit ..... (VII-A-1), the weighted average electric bills of the companies in this particular classification are higher than those of the companies in any other distance from general headquarters classification.

It may also be noted that the payment of relatively larger average common stock dividends by companies located less than 200 miles from their respective general

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headquarters resulted in the total distributions for use of capital for companies in that group being higher than for any of the other distance from headquarters groups.

Q. In your opinion, as the result of your studies, do differences in the distance of operating utilities from their respective holding company general headquarters tend to be accompanied by any significant differences in the quality of financial management of such operating utilities? A. None whatsoever.

VII-C-1
(III-B-3)

Exhibit .....

INCOME ADMINISTRATION RATIOS OF SUBSIDIARY UTILITIES; CLASSIFIED ACCORDING TO DISTANCE FROM GENERAL HEADQUARTERS, 1939

Distance from General Headquarters	Averages Number of Companies	a Common Stock Earnings as Per Cent of Income	b Common Dividends as Per Cent of Common Stock Earnings*	c (100 — a) Interest Plus Preferred Dividends as Per Cent of Income	d Common Stock Dividends as Per Cent of Income	e (c + d) Earnings Spent for All Capital as Per Cent of Income	f (100 — b) Earnings Retained as Per Cent of Common Stock Earnings*	g (100 — e) Earnings Retained as Per Cent of Income
Less than 200 miles	68	64.0	73.5	36.0	56.1	92.1	26.5	7.9
200 to 500 miles	47	40.0	52.5	60.0	25.7	85.7	47.5	14.3
501 to 1,000 miles	59	29.2	44.3	70.8	17.8	88.6	55.7	11.4
1,001 to 2,000 miles	38	30.7	43.0	69.3	15.4	84.7	57.0	15.3
Over 2,000 miles	9	32.1	34.3	67.9	16.5	84.4	65.7	15.6
Total Companies	221	42.6	54.9	57.4	30.8	88.2	45.1	11.8

* Average computed excluding 12 companies neither earning nor paying common stock dividends.

Source of data: Moody's Manual of Public Utilities, 1940.

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Q. Now, will you please describe the fourth section in your fourth major group of studies? A. This section of the studies seeks to determine what relationship, if any, the factor of distance of the operating company from the main office or general headquarters of its holding company might bear to each of the several indexes or measures which have been employed as in previous studies to measure protection of investors.

Q. In this connection, have you prepared a table entitled, "Investor Protection Ratios of Subsidiary Utilities Classified According to Distance from General Headquarters, 1939"? A. Yes.

(Have Exhibit VII-D-1 marked Exhibit ..... for Identification.)

Q. Was Exhibit ..... for Identification (VII-D-1) prepared by you or under your supervision? A. Yes.

Q. Do you believe the data set forth thereon to be accurate? A. I do.

Q. Where were the data thereon secured? A. From the same sources as the data appearing on Exhibits ..... (IV-D-1) and ..... (VII-D-1), which sources have been previously stated.

Q. Please describe Exhibit ..... (VII-D-1) for Identification. A. It is a table which classifies three groups of holding company subsidiaries, constituting, respectively, 210, 161 and 221 companies, into five classifications based on the distance of the operating companies from the main office of their respective holding companies. These are the same three groups of holding company subsidiaries which were classified in different ways on earlier exhibits. These three groups are classified in the same five distance from general headquarters classifications which I have used in this fourth group of studies. This particular table shows, in respect of the bonds and preferred stocks of companies in each of said five distance from headquarters classifications, (1) the average number of times bond interest has been earned, (2) the average percentage of gross revenue

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remaining after bond interest, (3) the average number of times bond interest plus preferred stock dividends have been earned, (4) the average percentage of revenue remaining after both bond interest and preferred stock dividends, and (5) the average ratio of common stock earnings to income.

(Here offer Exhibit ..... for Identification (VII-D-1) in evidence.)

Q. What does Exhibit ..... (VII-D-1) indicate with respect to the relationship of distance of the operating company from its general headquarters to the protection afforded to bondholders and preferred stockholders of such company, as measured by the several indexes of investor protection which you have employed in these studies? A. The "times interest earned" ratios and the "times preferred stock dividends and interest earned ratios" for all companies more than 200 miles distant from their respective general headquarters are practically identical. The failure of the bond interest coverage ratios or the preferred dividends and bond interest coverage ratios to show any significant increases as the distance from headquarters increases from 200 miles to more than 2,000 miles, sufficiently negatives any conclusion that there is any relationship between interest and preferred dividend coverage and distance of the operating company from general headquarters.

It does appear statistically that the companies located less than 200 miles from general headquarters average much greater interest coverage and preferred stock dividend coverage than the companies in the other four groups. This result is naturally to be expected in view of the fact, previously mentioned, that these companies in the less than 200 miles from headquarters group show smaller average payments of bond interest and preferred dividends than all other holding company subsidiaries; they have more conservative financial structures than companies away from New York and New England. Of the 56 companies which comprise the class located less than 200 miles from general headquarters, and in respect of which the average "times

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interest earned" ratio was derived, 46 or 82% thereof, are controlled from New York City or vicinity. Of the 32 companies which comprise the class of companies located less than 200 miles from general headquarters and in respect of which the average times interest plus preferred dividends earned ratio was derived, 23 thereof, or 72% thereof, are controlled from New York City. The higher common stock-equity ratio typical of these New York-New England holding company subsidiaries is a fact which carries as obvious a relation to their geographic location as it does to their nearness to headquarters.

It may be pointed out in passing that whatever significance there might seem to be in the higher coverage figures on the part of the so-called "local" subsidiaries from the point of view of investor protection is greatly minimized by the fact that the average percentage of gross revenue remaining after payment of interest for these companies in the less than 200 mile class does not average significantly above that of the companies in the other distance from headquarters classes.

Q. What is your general conclusion with respect to the particular point under discussion? A. In my opinion mere distance of operating companies from the main office of their respective holding companies in and of itself does not tend to be related in any way to the character and quality of the protection accorded to the investors in the securities of such operating company.

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Exhibit .....

VII-D-1
(IV-C-1, 2, 3)

INVESTOR PROTECTION RATIOS OF SUBSIDIARY UTILITIES CLASSIFIED ACCORDING TO DISTANCE FROM GENERAL HEADQUARTERS, 1939

Distance from General Headquarters	1 Bond Protection			2 Preferred Stock Protection			3 Balance of Income	
	Number of Companies	Average Times Interest Earned	Average Per Cent Revenue Remaining after Interest	Number of Companies	Average Times Dividends and Interest Earned	Average Per Cent Revenue Remaining after Preferred Dividends	Number of Companies	Average Common Stock Earnings as Per Cent of Income
Less than 200 miles	56	8.2	17.8%	32	2.0	10.9%	68	64.0%
200 to 500 miles	47	2.7	17.3	38	1.8	11.9	47	40.0
501 to 1,000 miles	59	2.4	14.8	51	1.5	8.5	59	29.2
1,001 to 2,000 miles	38	2.1	15.2	32	1.5	10.0	38	30.7
Over 2,000 miles	10	2.1	16.7	8	1.7	9.6	9	32.1
Total Companies	210	4.0	16.3%	161	1.7	10.1%	221	42.6%

Source of data: Moody's Manual of Public Utilities.

Q. Up to this point, Dr. Waterman, you have discussed the relationship, or lack of relationship, between certain factors, such as holding company control, size of operating company, and so forth, which we have usually referred to as the regulatory or remedial devices of Section 11, and certain other factors, such as cost of electric service to consumers, economy of management and operation of utilities, economy and efficiency of financial management of utilities, and protection of investors, which latter factors we have referred to as the objectives of the Act. Now, have you made any further study within the general field of the studies already described? A. Yes. I made a study designed to determine whether the fact that an operating utility is controlled by a holding company in and of itself tends to hinder or otherwise adversely affect the regulation of such operating utility by State regulatory commissions.

Q. What specifically led you to make this particular study? A. At the time of my original conversations with counsel for the respondents, which I have already mentioned, they called my attention to several references in Section 1 and elsewhere in the Public Utility Holding Company Act, to the phrase "effectiveness of State regulation of utility companies", or similar phrases; and they stated that they had been considering whether it was possible to determine statistically the relationship between effectiveness of State regulation of utilities and factors such as holding company control, size of operating company, and so forth. They questioned the relevance of such an inquiry to the general subject matter under discussion and stated that it seemed perfectly clear that effectiveness of regulation, in and of itself, was not a legislative objective of the Act; that obviously effective public regulation of utilities was referred to and sought merely as a means of accomplishing the fundamental objectives of the Act, such as low cost of utility service to consumers and protection of investors; and that accordingly it seemed to them that the best way of determining the relationship of a factor such as holding company control to the effectiveness of State regulation was to test the relationship of holding company control to

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statutory objectives such as the cost of utility service to consumers and protection of investors, since, they said, effectiveness of regulation was desired as a means to such objectives. They asked me, however, whether in my opinion it was possible to devise any indexes or measures for testing statistically the relationship between effectiveness of State regulation of utilities, as such, and the factor of holding company control of utilities.

Q. What was your reply to that question? A. I said that in my opinion it was not possible to measure statistically and objectively so intangible a thing as effectiveness of public regulation of utilities. I did say, however, that I thought it would be both practicable and possible to analyze certain factors affecting regulation of utilities by State regulatory bodies not primarily on the basis of statistics but on the basis of current facts and opinions gathered from State and Federal regulatory officials and from observation of specific cases and from what seemed to me to be the reasonable logic of the situation. Such an analysis, I said, should afford a basis for arriving at an intelligent opinion respecting the relationship of holding company control to the effectiveness of State regulation. Counsel for respondents thereupon asked me to undertake such a study; and they suggested that I should not undertake an historical study of the question but should endeavor to ascertain the current facts regarding the situation as it exists at the present time.

Q. And you did undertake such a study? A. Yes.

Q. What were the factors affecting State regulation of utilities which you undertook to analyze? A. It seemed to me that there are three possible channels through which public utility holding companies could exert influence over their respective operating subsidiaries in a manner which might conceivably impede the effectiveness of State regulation of such subsidiaries.

In the first place, mutual service affiliates often perform managerial and supervisory services for or on behalf of their operating subsidiaries and, of course, they make charges for such services, said charges being generally known as "management fees." If such management fees

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are excessive in amount, the operating subsidiaries might be injured to such an extent that the interests of consumers served by such operating subsidiaries or the interests of holders of securities of such operating subsidiaries would be adversely affected. This possibility presents the question whether there is anything inherent in the nature or character of such management fees which prevents State regulation thereof from being as effective and as efficient as State regulation of corresponding charges of independent utilities.

Moreover, if the managerial or supervisory services performed for or on behalf of the operating subsidiaries by service affiliates are inefficient or of an inferior quality, the efficiency of the operating subsidiaries might be impaired to such an extent that the interest of consumers served by such subsidiaries or the interests of the holders of the securities of such subsidiaries would be adversely affected. This possibility presents the question whether there is anything inherent in the nature or character of such managerial and supervisory services which would necessarily prevent State regulation thereof from being as efficient or effective as State regulation of corresponding services performed by or for independent utilities.

In the third place, the holding company, as owner of the controlling voting equity of its operating subsidiaries, possesses the same powers and responsibilities as any controlling stockholder or group of controlling stockholders with respect to the policies of the operating enterprise. It is, of course, possible that such control over the policies of the operating subsidiary might be exerted in such a way as to attempt to hinder the effectiveness of State regulation of such subsidiary. This possibility presents the question whether there is anything inherent in the nature or character of control of the voting equity of an operating utility by a holding company which prevents State regulation of said utility from being as effective and as efficient as it might be if such voting control were not possessed by a holding company.

Q. How did you undertake to analyze the relationship of the three factors which you have mentioned to the effectiveness of State regulation of operating subsidiaries? A. Obviously, such factors as the reasonableness of management fees, the quality of managerial services, and the influence of ownership or voting control do not readily permit of statistical comparisons or objective study. Accordingly, my analyses with respect to the three factors in question have been based primarily on current facts and opinions gathered from State and Federal regulatory officials and from observation of specific cases of State regulatory activities in respect of utilities. When it came to analyzing the relationship of ownership or voting control over operating subsidiaries to the effectiveness of State regulation, the problem resolved itself essentially into a study of corporate attitudes, that is, a study or comparison of the attitudes which the managements of holding company subsidiaries and independent utilities, respectively, take with respect to State regulation. To aid in the analysis of such corporate attitudes, I attempted to secure certain relevant information by sending a questionnaire to all the various State commissions having jurisdiction over public utilities.

Q. Do you have a copy of that questionnaire and the form of letter which accompanied it? A. Yes.

(Have Exhibit VIII-A-1 marked Exhibit ..... for Indentification.)

Q. Is Exhibit ..... for Identification (VIII-A-1) the form of questionnaire and the form of letter to which you have referred? A. Yes.

(Here offer Exhibit ..... for Identification (VIII-A-1) in evidence.)

Q. Please describe the questionnaire which is now Exhibit ..... (VIII-A-1), the results obtained therefrom, and the use which you made of such results. A. The questionnaire was designed to ascertain the experience of the several State regulatory commissions with respect to the

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cooperativeness of all the operating utilities under their respective jurisdictions as to various phases of the regulatory process, such as regulation of rates, regulation of accounting practices, and regulation of security issues. By the questionnaire, each State regulatory commission was asked to rate each utility under its jurisdiction which was involved in any formal or informal proceeding before it during the year 1939 as to the character and quality of its cooperativeness in various matters within the jurisdiction of the commission. It will be noted that the questionnaire was set up so as to avoid leading or suggesting the replies in order to obtain fair and unbiased responses. For example, there was nothing about the questionnaire which would indicate that it was being used as a basis for making any comparisons as between holding company subsidiaries and independent utilities; that is to say, the questionnaire asked for data in respect of individual utilities to be named by the respective commissions. Because the data was furnished with respect to individual, named utilities, I was able to classify the results as between holding company subsidiaries and independent utilities.

I received answers to the questionnaires from 21 out of the 42 State regulatory commissions to which the questionnaires were sent. Most of the answers to the questionnaires were complete and satisfactory. In some cases, the answers did not have the blessing of the State regulatory commission itself but represented the personal views of one of the members of the commission or of a member of the commission staff. My inquiry or research, of course, did not end with the replies to the questionnaire. I went further and corresponded with and actually interviewed personally a large number of members of the various State regulatory commissions and their staffs. My opinions and conclusions are based on such interviews and correspondence as well as on the answers to the questionnaires.

Q. Will you now take up the first of the three factors which you mention, namely, management fees, and discuss the same from the point of view of effectiveness of State regulation thereof as of the present time? A. Manage-

ment fees have been a major source of complaint on the part of State regulatory commissions with respect to the regulation of the operating subsidiaries of holding companies. In the past, this complaint was primarily predicated on the fact that State regulatory commissions did not have access to adequate sources of information concerning the actual costs of rendering the management services in respect of which the management fees were paid. Some, at least, of the State commissions were not satisfied with the type of evidence presented by such operating subsidiaries to show that they were getting their "money's worth" for the managerial fees paid by them. In recent years, this situation has been changed by reason of the enactment of the Public Utility Holding Company Act. Pursuant to power vested in it by the Act, the S.E.C. has issued rules and regulations requiring annual and special reports with respect to management fees by mutual service companies and by operating subsidiaries of registered holding companies. These reports make generally available data with respect to management fees which were not available prior to the enactment of the Act. Thus at the present time there is no lack of information available to State regulatory commissions with respect to management fees. This is especially true because the Act appears to provide for cooperative action by the S.E.C. and State regulatory commissions, at the request of the latter, with respect to regulation of management fee contracts and other matters.

It is, of course, true that not all States have regulatory commissions and not all State commissions have authority to regulate management service contracts. It is, however, wholly within the powers of all State legislatures to provide for State regulatory commissions with adequate powers to regulate management fees, and today adequate sources of information exist which would permit effective State regulation of such matters.

But whatever may be the situation at the present time so far as State regulation of management fees is concerned, since the enactment of the Public Utility Act of 1935 the

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interests of consumers of gas and electricity and of investors in utilities would seem to be adequately protected, so far as the regulation of management fees is concerned, by the comprehensive powers vested in the S.E.C.

Q. What is your general conclusion with respect to the effectiveness of regulation of management fees at the present time? A. In my opinion, there is no evidence that at the present time State regulation of management fees is less efficient or effective than State regulation of corresponding charges of independent utilities; certainly there is no reason why it need be less efficient and effective. Moreover, at the present time, so far as operating subsidiaries of registered holding companies are concerned, the regulation of management fees by the S.E.C. is clearly even more comprehensive and effective, by and large, than State regulation of the charges to independent utilities for management services.

Q. Will you now turn to the second of the three factors which you have mentioned, namely, quality of service by management companies, and discuss the same from the point of view of effectiveness of State regulation thereof? A. In my opinion, no reason exists at the present time why State regulatory commissions cannot regulate the quality of service rendered to holding company subsidiaries by mutual service companies as effectively and efficiently as they can regulate the quality of any type of managerial service performed for independent utilities; and there is no evidence that at the present time State regulation of the quality of service performed for holding company subsidiaries by service affiliates is less effective than State regulation of the quality of the managerial services rendered to independent utilities.

My studies disclosed that some State regulatory commissions have a definite preference for dealing with holding company subsidiaries served by mutual service companies rather than with independent utilities, particularly small independents. They indicated that they prefer to deal with representatives of service organizations because such persons are usually better trained and more skillful in present-

ing and handling the various problems which arise before a State regulatory commission. I found, however, that a few of the commissions, which may be characterized as "weaker commissions" in the sense that they are less well financed, have fewer facilities and personnel to carry on their functions or have a limited regulatory jurisdiction, are less desirous of dealing with representatives of the better service organizations because apparently they feel themselves at a disadvantage in matching wits with more skillful opponents.

It is generally agreed that the conference method plays an important part in modern utility regulation, and my survey shows that representatives of holding company subsidiaries are reported to be as willing to cooperate in the avoidance of long drawn-out legal contests and other controversies as representatives of independent utilities. My survey also shows that data presented to State Commissions in rate, accounting and security cases are often more complete and in better form when presented by or on behalf of holding company subsidiaries than when presented by or on behalf of the smaller independent utilities.

It is, of course, true that the larger independent utilities attain equal skill and completeness in their presentation of cases before State commissions and are equally as far-sighted as holding company subsidiaries in their willingness to cooperate with the regulatory process, so that the fact I have last mentioned may be considered more a function of the size of a utility than of the character of the control over the utility. Large independent utilities can and do afford the same advantages which arise from having cases before State regulatory commissions handled by competent and experienced attorneys, accountants, engineers and executives. On the other hand, all holding company subsidiaries, even the very small ones, have these advantages.

I found that there were some complaints about "stalling tactics" before State commissions where important matters were at stake; but there was no suggestion that this particular criticism was any more applicable to holding company subsidiaries than to independent utilities.

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Upon a consideration of all the answers to the questionnaires and the correspondence and numerous conferences with members of State commissions and with officers and employees thereof, I find no criticism of the quality of utility management which does not apply equally to independent utilities and holding company subsidiaries.

Q. What is your general conclusion with respect to the effectiveness of regulation of the quality of management services performed by service affiliates for holding company subsidiaries? A. In my opinion, there is at the present time no evidence that State regulation of the quality of management services performed for holding company subsidiaries is less effective or efficient than State regulation of the quality of management services performed by or for independent utilities; certainly there is no substantial reason why State regulation need be less effective in one case than in the other. Moreover, so far as the operating subsidiaries of registered holding companies are concerned, the regulation of the quality of management services thereof by the S.E.C. is, by and large, more comprehensive and effective than State regulation of the quality of management services performed by or for independent utilities.

Q. Will you now turn to the third of the three factors which you have mentioned, namely, ownership or voting control influence, and discuss the same from the point of view of the effectiveness of State regulation. A. In considering the relationship of voting control of or ownership influence over utilities to the effectiveness of State regulation thereof, the matter of corporate attitudes is even more important than in connection with the two factors previously discussed. The attitudes and intentions of corporations are, of course, expressed through the personalities of the directors and corporate executives, and from that point such attitudes filter down through the line of lesser corporate employees. In the same way, the corporate attitudes of a holding company will be reflected in the attitudes of any service organization included in the holding company system.

There could, of course, be no more reasonable expectation than that one would find good, bad and indifferent ownership policies represented, not only in the performance of holding company organizations but also in the performance of independent utilities. Such corporate attitudes were the specific objective of the questionnaire previously discussed which was directed to all State regulatory commissions having jurisdiction over utilities in an effort to ascertain the degree of cooperation with the regulatory process exhibited by the various utility companies under the jurisdiction of each commission. Twenty-one commissions replied to inquiries pertaining to the cooperation by the utilities in rate, accounting and security cases. These replies clearly indicate that there is no significant difference between holding company subsidiaries and independent utilities so far as cooperation with State regulatory commissions is concerned. In view of the fact that the questionnaire was so devised as not to indicate that any comparisons were intended as between independent utilities and holding company subsidiaries, it is significant that good, bad and indifferent reports were received regarding the cooperativeness of both independent utilities and holding company subsidiaries.

As I have previously stated, the answers to the questionnaires were checked by correspondence and personal interviews with members of State commissions and their staffs. It is fair to say that practically all the State commissions which were interrogated were quite satisfied with their ability to cope equally well with independent utilities and with holding company subsidiaries within the limits of their respective statutory jurisdictions. Moreover, there seems to be a universal feeling on the part of all commissions interrogated that both groups of utilities are adapting themselves to existing regulatory conditions and devices with equal facility and willingness.

I was particularly interested in, and I checked with special care, the views of State regulatory commissions and their staffs with respect to regulation of security issues of

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holding company subsidiaries and of independent utilities. In view of the complexities involved in matters of financial management and security issues, and because of past criticisms of the financial policies of public utility holding companies, which criticisms in some instances were certainly well founded, I had expected to find State regulatory bodies at least suspicious of holding company influence in this regard. I found, however, that State regulatory commissions seem to have practically no complaint to make in respect of the effectiveness of the regulation of the issuance of securities by holding company subsidiaries. Both holding company subsidiaries and independent utilities alike are generally characterized as being fully cooperative with the State commissions in such matters. The reaction which I secured on this point is, of course, limited to views expressed by those who replied from the 32 States in which there are commissions which have jurisdiction over utility security issues.

It may be that the present universal lack of complaint in respect of State regulation of utility security issues, both those of independents and holding company subsidiaries, is due to the effectiveness and influence of Federal regulation of securities under the Public Utility Holding Company Act and under the Securities Act of 1933; or it may be that utilities generally have discovered certain advantages in effective public regulation of security issues; but whatever may be the cause, the fact is that at the present time there is no evidence whatever that holding companies and holding company subsidiaries interfere with or impede effective State regulation of financial matters to any greater extent than independent utilities.

Specific inquiries regarding the experience of State commissions with respect to regulation of matters of utility accounting elicited the information that out of 43 cases involving such matters cited by the reporting commissions there was unsatisfactory cooperation from utilities in only five such cases. Two of such five cases involved holding company subsidiaries and three of them involved independent utilities.

It is perhaps significant to note that the greatest number of complaints regarding the quality of cooperation in regulatory matters between utilities and State commissions pertained to natural gas companies. These companies, both independent utilities and holding company subsidiaries, are units in an adolescent industry and they are but demonstrating a usual characteristic of adolescents, namely, rebellion against regulation. The complaints with respect to lack of cooperation in regulatory matters on the part of natural gas companies applied equally to independent utilities as to holding company subsidiaries.

I made no effort to analyze specifically the influence of holding company policies upon State regulation of matters such as intra-system loans, dividend payments, mergers, acquisitions, and like matters. So far as the operating subsidiaries of registered holding companies are concerned, whatever powers State commissions may have in respect of these matters are completely eclipsed and, as a practical matter, rendered ineffective, by the comprehensive powers conferred on the S.E.C. by Sections 10, 11(b)(2) and 12 of the Public Utility Holding Company Act. The regulatory provisions which are available under Federal statutes for the purpose of protecting working capital position or for precluding any so-called "milking" of subsidiaries by improper loans or excessive dividends or by any other device, are in excess of anything that State regulation has attempted to attain in these respects.

Q. Please state your general conclusions as a result of the group of studies relating to effectiveness of regulation. A. So far as the effectiveness of regulation of the operating subsidiaries of holding companies is concerned, there has been a substantial change in the situation in recent years. Whatever may be the precise cause, relationships between State regulatory bodies and those in control of holding company systems have steadily improved in the last decade.

As a result of my studies and observations, it is my considered opinion that at the present time there is no evidence of any more lack of reasonable cooperation with State regulatory authorities on the part of holding companies and

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holding company subsidiaries than there is on the part of independent utilities; nor is there any evidence that the effectiveness of State regulation is impeded in any important manner by the existence of holding companies. To state it more accurately, my studies indicate that State regulation of holding company subsidiaries is at the present time as efficient and effective as State regulation of independent utilities; certainly there is no reason why State regulation of one need be less effective or efficient than of the other.

It is true that the attitudes of some holding company systems with respect to public regulation are not beyond criticism but the same is equally true of the attitudes of at least a proportionate number of independent utilities. I cannot say that holding company subsidiaries show attitudes of management and ownership in cooperativeness with respect to State regulation which are appreciably superior to those of independent utilities, but certainly there is no evidence that the contrary is true.

Looking at the overall picture of public regulation of utilities, that is, both State and Federal regulation, it is quite clear that at the present time the activities of the operating subsidiaries of holding companies are more comprehensively and effectively regulated than the corresponding activities of independent utilities. This is so because of the comprehensive regulatory powers with respect to management fees, rates, accounting matters, security issues, and other matters which have been vested in the S.E.C. and the F.P.C. as the result of relatively recent Federal legislation.

Q. Are you generally familiar with the order dated July 23, 1941, issued by the S.E.C. directing Engineers Public Service Company to divest itself of two of its subsidiaries; namely Puget Sound Power & Light Company and The Key West Electric Company. A. Yes.

Q. Are you generally familiar with the order entered in these proceedings on March 11, 1941, directing the respondents to show cause by the S.E.C. should not forthwith issue an order requiring Engineers Public Service Company to

divest itself of its interest in all subsidiaries other than Virginia Electric and Power Company and Savannah Electric and Power Company; or, Gulf States Utilities Company, El Paso Electric Company and Baton Rouge Bus Company, Inc.? A. Yes.

Q. Are you also generally familiar with a similar order which has been entered in the proceedings against United Gas Improvement Company and its subsidiaries under Section 11(b)(1) of the Act? A. Yes.

Q. Assuming that Section 11(b)(1) is held to be constitutional, and that it is enforced generally against all registered holding companies by the S.E.C. in the manner indicated by the several orders of the S.E.C. which have been mentioned, and that as a result many operating subsidiaries of holding companies which are now subject to the regulatory jurisdiction of the S.E.C. will be removed from such jurisdiction and left to public regulation by the authorities of the particular States in which such operating subsidiaries are located, what in your opinion will be the probable consequence, so far as the effectiveness of public regulation of operating utilities is concerned? A. In my opinion the operating subsidiaries which are thus removed from the regulatory jurisdiction of the S.E.C. will thereafter in many cases be less effectively and less efficiently regulated than they now are. This will be so because (1) in some States there are no State regulatory commissions, (2) the scope of the regulatory authority of some of the State commissions is quite limited, and (3) the regulatory jurisdiction of the S.E.C. over operating utilities subject to its jurisdiction is much more comprehensive in many respects than that of any State regulatory commission.

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VIII-1 Exhibit.....

September 19, 1940

Dear Mr. .....:

Section 1(b) 3 of the Public Utility Holding Company Act (1935) cites as one of the basic reasons for the need of Federal regulation of holding companies the fact that the " . . . control of subsidiary public-utility companies affects the accounting practices and rate, dividend, and other policies of such companies so as to complicate and obstruct state regulation of such companies . . . ." At the time the Holding Company Act was drafted there may have been ample evidence throughout the utility industry to justify the purpose clause as quoted. At the moment I am particularly interested in determining the current facts relating to the question, and I am taking the liberty of requesting opinions on the matter from the State utility commissions.

The search for facts on this question comprises but one phase of a broad study of the economics of public utility holding companies which I am undertaking in an effort to bring up to date a previous work which I completed about 1934. Other angles include studies of rates and financing which can and are being studied from published sources of information, but I feel that only from the State commissions themselves can I get satisfactory answers to the questions of the current effectiveness of State regulation as affected by holding company relationships.

With full realization of the limitations of a questionnaire as a means of assembling more or less qualitative data, I have prepared the accompanying form and am submitting it to all State commissions with this request for cooperation in the determination of current conditions. For my part I guarantee that the returns will not be used or published in their raw state as statistical evidence leading to any conclusion one way or the other. Rather, I shall use the data as clues to further investigation, with

VIII-1 (continued)

the expectation that interviews and subsequent study will provide the basis for final analysis.

In the light of this statement of objectives and purposes, I hope that "just another questionnaire" will not try your patience too greatly and that I may have the courtesy of your cooperation. Also, any comments you may care to make beyond the questionnaire regarding the effects of holding company control on State regulation will be greatly appreciated. If you are interested in the results of the study, I shall be pleased to communicate with you as the work progresses.

Very truly yours,

M. H. WATERMAN,
Associate Professor of Finance
University of Michigan.

MHW-ELM

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VIII-1 (continued)

Exhibit .....

.....
(state)

QUESTIONNAIRE PERTAINING TO THE EXPERIENCE OF STATE UTILITY COMMISSIONS, REGULATION OF RATES, ACCOUNTING, AND SECURITY ISSUES

Instructions for Reporting

1. Please report on *all* gas and electric company cases appearing on your docket during the year 1939. (Indicate calendar or fiscal year .....)
(Date, if fiscal year)

2. In the appropriate column indicate your opinion of the degree of cooperation with management of the utility involved (regardless of whether the company is a unit in a holding company system).

3. Use the following code to express your opinion of the degree of cooperation:

X = Excellent cooperation
S = Reasonably satisfactory cooperation
N = No cooperation
T = Obstructionist attitude
O = ...
(any other characterization you may wish to include)

4. It is mutually understood and agreed that these data as reported *will not* be used in any way to represent publicly or in published form the opinion of any particular commission or the attitude of any particular company.

5. The opinions expressed herein are those of
a. the commission ☐
b. ..... ☐ } check one
(an individual)

6. Name of person to whom subsequent inquiries or reports should be addressed: .....

Please return to:

MERWIN H. WATERMAN,
108 Tappan Hall,
University of Michigan
Ann Arbor, Michigan.

MHW: Form 9

MHW—Form 9a **Exhibit .....(concl**

VIII-1 (concluded) .....
(state)

Docket No.	Gas and/or Electric Operating Company	Rate Case	Accounting Case	Security Issue	

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